JAGRAN COLLEGE OF ARTS, SCIENCE & COMMERCE

A Self-Financing Post Graduate College Affiliated to CSJM University, Kanpur

620, W Block, Saket Nagar, Kanpur - 208014

Audit Reports/Certificates

Green and Environment Audit and Energy Audit Reports with Certificates

CIL Ref. No.:	CIL/20242262
Name of organization:	Jagran College of Arts, Science & Commerce
Address of premises:	620,' W' Block, Saket Nagar, Kanpur-208014, U.P.
Name of Inspector:	Mr. Ashutosh Tiwari
Date of Inspection:	21st and 22nd March 2024
Type of Inspection:	Green Audit

Organization Details	
Total Campus Area	14727 sq. meter
Total Built-up Area	5000 sq. meter
Covered Parking	148 sq. meter
Total Air-Conditioned Area	871.63 sq. meter
Non-Airconditioned Area	3788.56 sq. meter
Cross Floor Area	2683 sq. meter
Forest / Planted Area	03 (655 sq. meter)
Age of the building	2006 to till (18 years)

DETAILS OF INFRASTRUCTURE

Classrooms	35 No.
Laboratory	08 No.
Library	02 No.
Seminar hall and auditorium	1+1=02 No.
Sports room	01 No. (31.57 sq. meter)
Gymnasium	NA

Staff and student parking area	148 sq. meter
Canteen	1 No. (186.76 sq. meter)
Playground	2 No. (8038 sq. meter)
Green Area / Plantation	3 No. (655 sq. meter)

LIST OF BUILDINGS

Name of Building	Number of Floors	Area (m2)
Jagran College of Arts, Science & Commerce	5 Floors (including Basement)	5000 sq. meter

DEPARTMENTS

1	Commerce
2	Humanities, Arts and Languages
3	Science
4	Management
5	Computer Application

DETAILS OF STUDENTS AND STAFF

Total Number of Students	3119
Teaching Staff	60
Technical Staff	01
Non-Technical Staff	28
Outsourced Staff	14

GREEN AUDIT PARTICIPANTS

Name	Designation
Mr. Ashutosh Tiwari	Auditor
Dr. Asmita Dubey	Principal
Dr. Reshma Rajani	IQAC Co-ordinator, Asst. Prof. Dept. of Commerce
Dr. Hema Rohra	Chief Proctor, Asst. Prof, Dept. of Economics
Dr. Kamal Vinod Singh	Asst. Prof., Dept. of Commerce
Dr. Anshul Saxena	Asst. Prof., Dept. of Commerce

Dr. Swati Dwivedi	Asst. Prof., Dept. of Management
Dr. Anju Sachan	Asst. Prof., Dept. of English
Mr. Prashant Khare	Asst. Prof, Dept. of Physics
Mrs. Neelanshi Awasthi	Asst. Prof, Dept. of Zoology
Ms. Kanika Bajaj	Asst. Prof, Dept. of Commerce
Mr. Vikas Dwivedi	Asst. Prof, Dept. of Chemistry
Dr. Varsha Rani Srivastava	Asst. Prof, Dept. of Botany

LEGAL COMPLIANCES

Description	Registration Details
Consent to operate (CTO) from SPCB	NA
Fire NOC	UPFS/2023/94163/KPN/KANPUR NAGAR/2497/CFO
Water Boring permission	766/POB/RAGNAK/2012-13
DG Set Permission	NA

About Organization

Jagran College of Arts, Science and Commerce, Kanpur, is a milestone in Jagran's increasing endeavour under the umbrella of Jagran Education Foundation, an Educational Initiative of Jagran Group is an extension of the Shri Puranchandra Gupta Smarak Trust which was established in the year 1987 in the sacred memory of Late Shri Puran Chandra Gupta ji, the founder of Dainik Jagran Newspaper. It is one of the best multidisciplinary institutions of higher education registered under section 2F and 12B of UGC Act 1956, established in the year 2006 under self-financing scheme of CSJM University.

The College started with a strength of around 50 students in BA and B. Com, which has grown today to 3100 students (Approx.) in seven enriching academic programs, namely B. A, B.Sc. B. Com, B.com (Hons.) BBA and BCA at undergraduate level and a post graduate program in commerce i.e. M.com.

The objective of the college is to provide the best educational pursuits and to groom the personalities of energetic youth destined to lead this country soon. It also aims at developing students as socially and globally responsible members of the society who will be able to contribute towards national and international development, transmitting the deep-rooted Indian

values to the rest of the world through knowledge, wisdom, and technological excellence. The College has well qualified experienced and dedicated faculty. The most unique feature of the college is the bond between the students and the teachers and the ability to provide the most conducive and supportive environment to them. The alumni credit the institution for imbibing values of hard work, time management, team spirit, professionalism, and ethics

Jagran College at its sprawling campus is the most modern in infrastructure extended over four floors with a lift facility, lecture theatres, auditoriums, well stocked library, games and sports facilities and Wi-Fi. Jagran College is engaged in the cutting-edge research and teaching that helps in understanding global challenges.

Apart from being an Institution of Higher Learning our college is a center for the development of human potential. Holistic approach to education is adopted which emphasizes on the development of an all-round and well-balanced personality of the students, and to develop all dimensions of the human intellect so that our students help make our nation more democratic, cohesive, socially responsible, culturally rich and intellectually competent nation.

Vision

Jagran College aims to set a benchmark through a comprehensive learning environment in which faculty, staff and students can explore, examine, preserve, and disseminate the values, knowledge and wisdom which are prerequisites to ensure the upliftment of current and future generations. Through an educational mission it aims:

To shape the vision of academic success for all students, one based on high standards.

To create a congenial environment to education in order that safety, a co-operative spirit, and healthy interaction prevail.

To nurture leadership in others so that teachers and other staff members assume their parts in realizing the vision.

To conduct faculty development programs to enable teachers to teach at their best and students to learn to their utmost.

To manage people, data, and processes to cultivate overall improvement of the college.

Mission

Jagran College progressing with one vision and shared mission through determined beliefs, tireless efforts, and improvements, has completed seventeen glorious years of excellence. Looking

back to this journey of more than a decade is quite ameliorating, rewarding and gratifying. Jagran College has come a long way from where it once was by providing the students a learning that aims to empower them in finding the best of both cultural and material achievements.

The college also aims to carry the torch of knowledge to the extreme edges where higher education is yet to blossom. With concerted efforts we are committed to awaken youth to "Learn, Discover, Share, and Create" and make the world a better place, to become thoughtful and help them discover their talent and abilities. Sharing knowledge and experiences, creating opportunities, and enabling them to realize their dream is our mission.

GEOGRAPHICAL LOCATION WITH CAMPUS MAP IN SCALE

LAND USE DATA

Categories of Land Use	Area (M2)
PLANTATION AREA	6375+ 1663 Sq.mt.
BUILT UP AREA (INCLUDE ROADS)	5000+ 1008 Sq.mt.
TOTAL AREA	14727 Sq.mt.

CLIMATIC PARAMETERS

1. Climate: Kanpur, located in the northern Indian state of Uttar Pradesh, experiences a subtropical climate characterized by hot summers and mild winters, and a monsoon season from July to September. Summers are scorching, with temperatures exceeding 40°C, while winters are mild, averaging 15- 20°C during the day. Monsoons bring relief from the heat but also heavy rainfall. Humidity and rainfall beneficial for campus greenery, heavy rainfall may lead to water logging. Autumn offers pleasant weather, while winter nights can be cool, with occasional fog in January.

2. Rainfall: Average annual rainfall of 898 mm in approx. 43 rainy days. The rainy season starts during first week of July and ends in second week of October with duration of fourteen weeks. The average monsoon seasonal rainfall (June to September) is 782 mm. and can vary from 245 mm. to 939 mm./ 37 inch.

3. Temperature: The hot season from April 7 to June 27 with in average daily high temperature above 97°F (36.11°C). The hottest month of the air is June with an average high of 104°F (48.3 °C) and low 82 °F (27.7 °C). The cool season from December 7 to February 10 with an average daily high temperature below 77 °F (25 °C). The coldest month is January with a low of 48 °F (8.8 °C) and high of 71 °F (21.6 °C). The mean yearly temp. about 25.3 °C/ 77.5 °F.

BIO-DIVERSITY

Physical Count of Flora in Campus

S. No.	Particulars	Units
1	Trees	249
2	Plants	976
3	Gardens	2

List of Tree/Shrubs/Herbs Species found in the Campus

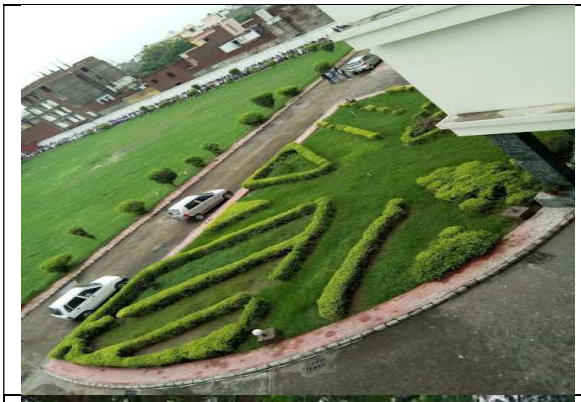
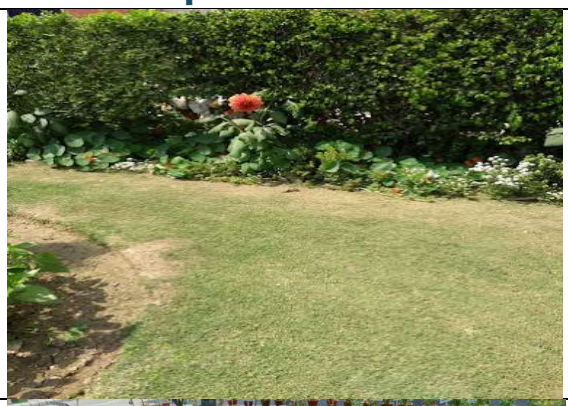
S. No	Botanical Names	Common names	Units
1	Anthoaphalus cadamba	**(Pila Kaner)**	8
2	Rosa indica (Variety)	**(Kaner)**	54
3	Maringa oleifera	**(Chandan)**	01
4	Callistemon splendens	**(Kari Patta)**	10
5	Tectona grandis	**(Lal Tecoma)**	04
6	Musa paradisiaca	**(Ashwagandha)**	01
7	Citrus limon	**(Ratanjot)**	02

8	Prosopis cineraria	**(Agnishikha)**	02
9	Mangifera indica	**(Lal Poinsettia)**	04
10	Punica granatum	**(Guldhai)**	01
11	Aegle marmelos (Bael)	**Champa)**	03
12	Araucaria columnaris (Christmas tree)	**(Tulsi)**	02
13	Delonix regia	**(SadaBahar)**	09
14	Cassia fistula (Golden shower plant)	**(Ajwain)**	20
15	Polyalthia longifolia	**(Ruby)**	47
16	Azadirachta indica	**(Antmul)**	13
17	Annona squamosa (sitafal) (Custard apple)	Custard apple	**02**
18	Nyctanthes arbor (Parijat tree)/ Rat ki rani	**(Bakul)**	**07**
19	Morus alba	**(KadhaChirayata)**	**01**
20	Saraca asoca	**(Philodendron)**	**01**
21	Ficus benghalensis (Banyan Tree)	**(Spider Plant)**	**01**
22	Ficus religiosa	**(Supari Palm)**	**01**
23	Ficus racemose	**(Duranta)**	**01**
24	Acacia catechu	**(Bargad)**	**01**
25	Terminalia arjuna	**(Murraya)**	**01**
26	Phyllanthus emblica	**(Sansvieria)**	**15**
27	Psidium guajava	**(Sansvieria)**	**08**
28	Calliandra haematocephala	**(Dracaena)**	**05**
29	Ficus Virence	**(Golden Pothos)**	**05**
30	Ficus elastica	**(Jade Plant)**	**05**
31	Pongamia pinnata	**(Croton)**	**05**
		(Syngonium)	
32	Palm Tree	**(Aglaonema)**	**05**
33	Senna siamea	**(Aloe Vera)**	**2**
34	Elaeocarpus ganitrus	**(Fern)**	**1**
35	Butea Monosperma	**(Rhapis)**	**1**
1	Thevetia peruviana	**(Agave)**	04
2	Nerium oleander	**(Yucca)**	03
3	Tabernaemontana divaricata (Crape jasmine)	**(Palm)**	25

4	Tabernaemontana divaricata (Crape jasmine)	**(Canna)**	20
5	Murraya koenigii	**Bargad)**	12
6	Tecoma	**(Tradescantia)**	01
7	Withania somnifera	**(Purple Heart)**	01
8	Jatropha curcas	**(Inchplant)**	01
9	Hamelia patens (Firebush)	**(Thuja)**	05
10	Euphorbia pulcherrima	**(Gudhal)**	02
11	Adenium	**(Bougainvillea)**	02
12	Plumeria obtuse	**(Enermi)**	01
13	Ocimum sanctum	**(Jangli)**	10
14	Catharanthus roseum	**(Akwan)**	05
15	Trachyspermum	**(Crown of Thorns)**	02
16	Ixora	**(Kalanchoe)**	05
17	Tylophora indica	**(Dragon Tail)**	01
18		**(Bargad)**	01
19	Mimusops elengi	**(Pila Kaner)**	01
20	Andrographics paniculata	**(Kaner)**	01
21	Philodendron	**(Chandan)**	20
22	Chlorophytum comosum	**(Kari Patta)**	50
23	Areca palm	**(Lal Tecoma)**	16
24	Duranta (Hedge plant)	**(Ashwagandha)**	-
25	Ficus species (Hedge plant)	**(Ratanjot)**	-
26	Murraya paniculata (Hedge plant)	**(Agnishikha)**	-
27	Sansvieria cylindrica	**(Lal Poinsettia)**	10
28	Sansvieria zeylanica	**(Guldhai)**	50
29	Dracaena variety	**(Champa)**	25
30	Epipremnum aureum (Goldenpathos)	**(Tulsi)**	50
31	Jade plant	**(SadaBahar)**	06
32	Croton variety	**(Ajwain)**	06
33	Syngonium podophyllum	**(Ruby)**	50
33	Aglaonema	**(Antmul)**	10
34	Aloe barbadensis	(Aloe vera)	50

35	Fern (Golden fern)	**(Bakul)**	10
36	Rhapis excels (Broadleaf lady palm)	**(KadhaChirayata)**	05
37	Agave vilmoriniana	**(Philodendron)**	20
38	Yucca variety	**(Spider Plant)**	10
39	Palm variety	**(Supari Palm)**	10
40	Canna	**(Duranta)**	50
41	Ficus variety	**(Bargad)**	04
42	Tradescantia spathacea (oyster plant)	**(Murraya)**	50
43	Tradescantia pallida (Purple heart)	**(Sansvieria)**	50
44	Tradescantia (inchplant variety)	**(Sansvieria)**	50
45	Thuja compacta	**(Dracaena)**	05
46	Hibiscus rosa-sinensis	**(Golden Pothos)**	63
47	Bougainvilea (Paperflower)	**(Jade Plant)**	06
48	Enermi (Hedge plant)	**(Croton)**	-
49	Prosopis cineria	**(Syngonium)**	3
50	Calotropis procera	**अग्लोनेमा (Aglaonema)**	2
51	Euphorbia milii	**(Aloe Vera)**	20
52	Kalanchoe blossfeldiana	**(Fern)**	6
53	Pedilanthus tithymaloides	**(Rhapis)**	100
54	Ficus benzamine	**(Agave)**	10

Images of Green Cover of the University Campus

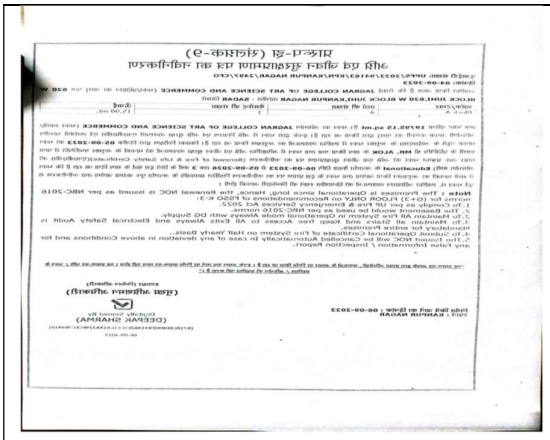
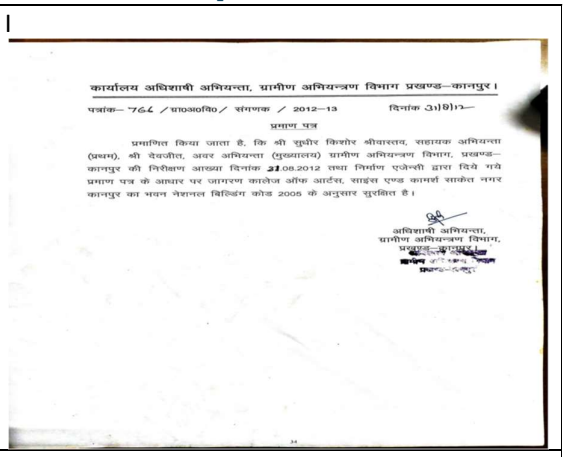
List of birds and animals

S. No.	Zoological Name	Common Name
1	Columba livia	Pigeon
2	Psittacula	Parrot
3	Corvus	Crow
4	Red- Whiskered Bulbul	Bulbul
5	Passer	Goriya (House sparrow)
6	Canis Familiaris	Common Dog
7	Funambulus	Squirrel
8	Felis Domesticus	Cat
9	Papilo Demoleous	Lime Butterfly
10	Dragon- Fly	Dragon- Fly

11	Apis indica	Honey Bee
12	Wasp	Tattaiya
13	Polyommatus icarus	Blue Butterfly
1	Chameleon	Girgit
2	Hemidactycus	House Lizard
3	Centipede	Kankhajura
4	Lady Bug	Beetle
5	Pheretima	Earthworm

LEGEAL REQUIREMENTS

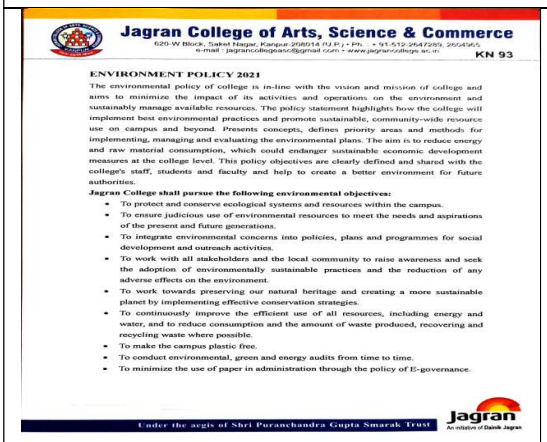
Description	Registration Details
Consent to operate (CTO) from SPCB	NA
Fire NOC	UPFS/2023/94163/KPN/KANPUR NAGAR/2497/CFO
Water Boring permission	766/POB/RAGNAK/2012-13
DG Set Permission	NA

	
I.FIRE NOC	II. Water Boring permission

GENERAL

General Requirements:Environmental Policies / Environmental Objectives, etc	
Is there an environmental policy? Is it publicly communicated?	Yes, there is an environmental policy available in place and it is publicly communicated. Reference doc/pic no: A1
Is there a defined waste management policy in the organization?	Yes, there is a waste management policy available. It outlines how to manage e-waste, paper waste, and solid waste. Reference doc/pic no: A2
Are there any quantifiable environmental objectives decided by the organization?	Yes, there are quantifiable environmental objectives decided by the organization. Reference doc/pic no: A3
Is the organization aware of all environmental Laws pertaining to different aspects of the organization's activities ? Mention laws & compliance status.	Yes, the organization is aware of all environmental laws pertaining to different aspects of the organization's activities. Reference doc/pic no: A4
Does the organization have any Recognition/certification for the environment friendliness? Provide details.	No record found at the time of audit.
Has the organization established any committee to decide, implement & monitor environmental initiatives?	Yes, the organization has established "Environmental club" for environmental initiatives. The club typically engages in a variety of activities, such as organizing clean-up drives, planting trees, waste management practices, Air quality monitoring etc. to advocating for eco-friendly practices in the community. The club also conducts awareness campaigns, workshops, and seminars to educate people about environmental

	issues, such as climate change, pollution, and deforestation. Reference doc/pic no: A4, A5,A8
Has the institution ever received any notice/warning from the pollution control board or any other concerned environmental authorities? If yes, then what corrective & preventive measures have been taken?	NO, college has not received any notice/warning from the pollution control board or any other concerned environmental authorities. Reference doc/pic no: A7
Related images / documents	



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ENVIRONMENT POLICY 2021

The environmental policy of college is in-line with the vision and mission of college and aims to minimize the impact of its activities and operations on the environment and sustainably manage available resources. The policy statement highlights how the college will implement best environmental practices and promote sustainable, community-wide resource use on campus and beyond. Presents concepts, defines priority areas and methods for implementing, managing and evaluating the environmental plans. The aim is to reduce energy and raw material consumption, which could endanger sustainable economic development measures at the college level. This policy objectives are clearly defined and shared with the college's staff, students and faculty and help to create a better environment for future authorities.

Jagran College shall pursue the following environmental objectives:

- To protect and conserve ecological systems and resources within the campus.
- To ensure judicious use of environmental resources to meet the needs and aspirations of the present and future generations.
- To integrate environmental concerns into policies, plans and programmes for social development and outreach activities.
- To work with all stakeholders and the local community to raise awareness and seek the adoption of environmentally sustainable practices and the reduction of any adverse effects on the environment.
- To work towards preserving our natural heritage and creating a more sustainable planet by implementing effective conservation strategies.
- To continuously improve the efficient use of all resources, including energy and water, and to reduce consumption and the amount of waste produced, recovering and recycling waste where possible.
- To make the campus plastic free.
- To conduct environmental, green and energy audits from time to time.
- To minimize the use of paper in administration through the policy of E-governance.

Under the aegis of Shri Puranchandra Gupta Smarak Trust Jagran An initiative of Dainik Jagran

A1.Environmental policy

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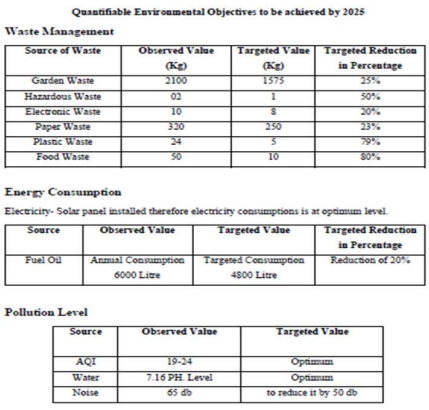
WASTE MANAGEMENT POLICY 2021

College has a green campus and gives priority to keep the campus clean and eco-friendly. To maintain clean and green campus we nurture a culture of social responsibility and sustainability and seek to create environmentally conscious generation that is capable of steering the world towards a more sustainable future. The policy includes the following:

- Proper segregation of solid waste into different categories based on their characteristics, such as recyclability, biodegradability, and toxicity.
- The usage of plastic is prohibited on campus.
- Implement a comprehensive plastic recycling program on campus, with designated bins for collecting plastic waste
- Composting of garden waste and food waste from canteens.
- To establish a sustainability committee or task force dedicated to reducing plastic waste on campus.
- To develop a technology-centric educational and administrative strategy to reduce solid waste.
- To engage students in processing waste using 3Rs principle - Reduce, Reuse and Recycle, through innovative activities.
- To raise awareness among students on food waste and introduce good practices
- To minimize the usage of packaged foods, as well as the habit of reusing and recycling non-biodegradable items
- To organize solid waste management workshops for students.
- To collaborate with industries/ NGO's regarding recycling of plastics.
- Organizing awareness campaigns by NSS to reduce plastic use.

Under the aegis of Shri Puranchandra Gupta Smarak Trust Jagran An initiative of Dainik Jagran

A2.Waste management policy



Quantifiable Environmental Objectives to be achieved by 2025

Waste Management

Source of Waste	Observed Value (Kg)	Targeted Value (Kg)	Targeted Reduction in Percentage
Garden Waste	2100	1575	25%
Hazardous Waste	02	1	50%
Electronic Waste	10	8	20%
Paper Waste	320	250	23%
Plastic Waste	24	5	79%
Food Waste	50	10	80%

Energy Consumption

Electricity- Solar panel installed therefore electricity consumptions is at optimum level.

Source	Observed Value	Targeted Value	Targeted Reduction in Percentage
Fuel Oil	Annual Consumption 6000 Litre	Targeted Consumption 4800 Litre	Reduction of 20%

Pollution Level

Source	Observed Value	Targeted Value
AQI	19-24	Optimum
Water	7.16 PH. Level	Optimum
Noise	65 db	to reduce it by 50 db

A3. Quantifiable environmental objectives

Environmental Laws Applicable:

Environment Protection Act, 1986:
- Regular internal audits to ensure compliance.
- Proper waste disposal practices implemented.
- Conservation efforts in place.
- Sustainable practices adopted institution-wide.

Air (Prevention and Control of Pollution) Act,1981:
- Measures to prevent and control air pollution implemented.
- Regular training and awareness programs conducted to educate on air quality issues and mitigation strategies.

Water (Prevention and Control of Pollution) Act, 1974:
- Proper waste disposal to prevent water pollution.
- Conservation efforts to minimize water usage and contamination.
- Educational programs emphasizing water conservation and pollution prevention.

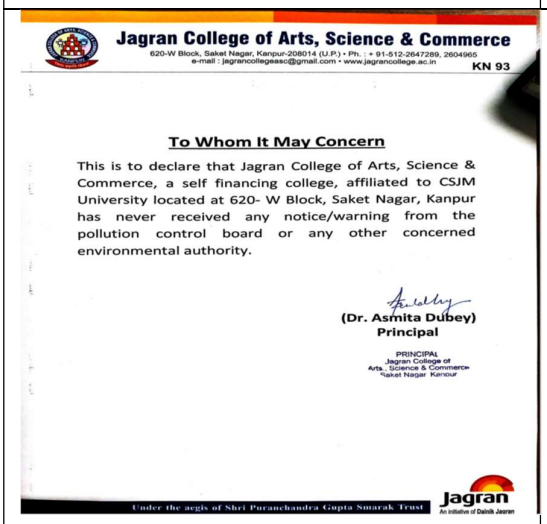
Specific Initiatives:
- Memorandum of Understanding (MOU) with Scrap Vendor:
- Responsible disposal of plastic and paper waste through recycling initiatives.
- Fire No Objection Certificate (NOC):
- Fire safety measures implemented as per regulations.
- National Building Code (NBC) Compliance:
- Adherence to NBC standards for safety and structural integrity.
- DG Set Maintenance:
- Regular maintenance to ensure uninterrupted power supply with minimal environmental impact.
- Recognition and Certificates:
- Campus recognized for environmentally friendly initiatives.
- Certificates obtained for pollution-free practices.

Ongoing Efforts: We have formally submitted an application seeking authorization for Groundwater boring operations.

A4. Environmental laws

A5.Tree Plantation Drive

A6.Clean and Green Campus Drive: (15/03/2024)



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To Whom It May Concern

This is to declare that Jagran College of Arts, Science & Commerce, a self financing college, affiliated to CSJM University located at 620- W Block, Saket Nagar, Kanpur has never received any notice/warning from the pollution control board or any other concerned environmental authority.

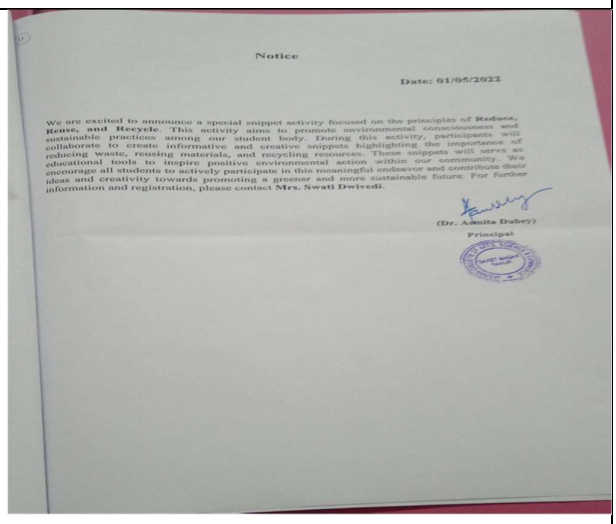
(Dr. Asmita Dubey)
Principal

PRINCIPAL
Jagran College of
Arts, Science & Commerce
Saket Nagar Kanpur

Under the aegis of Shri Puranchandra Gupta Smarak Trust

Jagran
An initiative of Dainik Jagran

A7. Self declaration



Notice

Date: 01/05/2022

We are excited to announce a special snippet activity focused on the principles of **Reduce, Reuse, and Recycle**. This activity aims to promote environmental consciousness and sustainable practices among our student body. During this activity, participants will collaborate to create informative and creative snippets highlighting the importance of reducing waste, reusing materials, and recycling resources. These snippets will serve as educational tools to inspire positive environmental action within our community. We encourage all students to actively participate in this meaningful endeavor and contribute their ideas and creativity towards promoting a greener and more sustainable future. For further information and registration, please contact **Mrs. Swati Dwivedi**.

(Dr. Asmita Dubey)
Principal

A8. Seminar on waste management

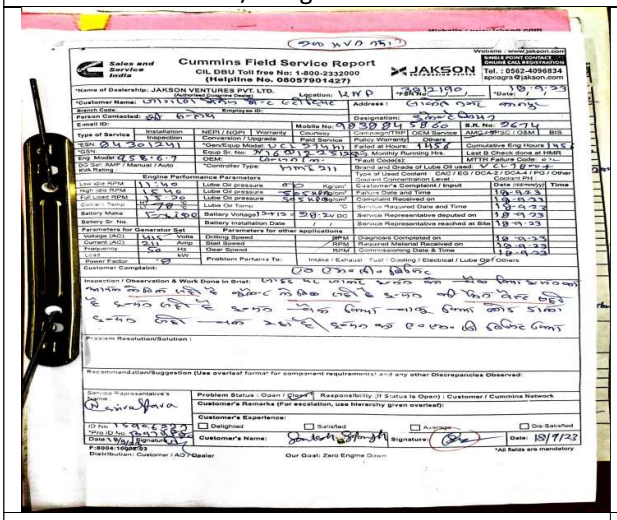
observation
1. The organization does not have any certification for environmental friendliness.

POLLUTION

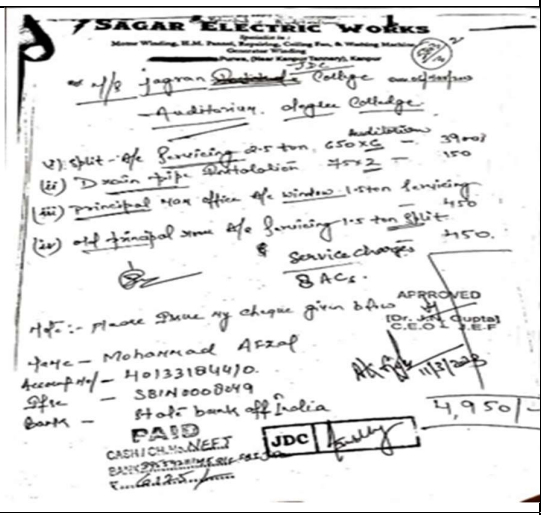
Air Pollution Management (objective, practices / methods to minimize air pollution)	
Identify the major sources of air pollution within the organization & the actions taken to either eliminate or minimize the pollution.	Vehicles, DG stack, and HVAC system are a major source of air pollution, which is why they have taken the initiative to implement green campus policy as well as they properly maintain their HVAC and DG stack.

HVAC maintenance and calibration records, testing and balancing reports. When was the duct system tested for leakage last?	HVAC maintenance for split AC units is performed by a local vendor, but calibration records and testing and balancing reports are not available. Reference doc/pic no: B1
DG set stack emission test as per CPCB norms.	The institute has a DG set as a power backup of 200kva that is used whenever there is a power cut-off due to load shading or maintenance of electricity on the college campus. The stack emission test for the DG set has been conducted; however, the noise and air pollution tests were not carried out. DG set air pollution level and noise pollution level conducted by CDG Inspection LTD. at the time of the Audit. Reference doc/pic no: B2

Related documents / images



B1. DG Set test report



B2. AC maintenance report

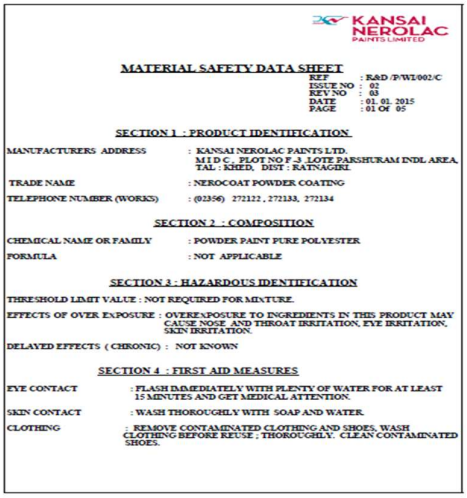
Observations:

- It is recommended that the institute conduct DG set stack emission test in accordance with CPCB.
- The organization needs to maintain a HVAC calibration records and testing and balancing reports and it should also maintain the Periodic record of the same.

In-Door Air Quality
(Checks, methods, tests & practices to ensure indoor air quality)

Does the organization test indoor air quality? Details of last indoor air quality test done.	There were no records to verify that the college conducted the test to check indoor air quality test. An indoor air quality check of the campus was Conducted by CDG Inspection Ltd. At the time of the audit. Indoor air quality level: 08 PM2.5: 25 µg/m³ Reference doc/pic no: C4
Is there a proper system of exhaust of indoor air?	Staff room, corridor, etc. comprises windows for proper ventilation. The indoor airflow was checked at the time of the audit and the outcome was 26.8 ft/mtr Reference doc/pic no: C5
Supplies: • Are 'Material Safety Data Sheets (MSDS)' available for different types of supplies (Ex: solvent, wax, adhesives, paints, flammables etc.)? • Are storage areas separate & ventilated properly? • Are less or nonhazardous materials used when possible? • Does the organization have a defined system to evaluate & find out safer alternatives? • Is there a defined procedure available for disposal of used substances?	• Yes, 'Material Safety Data Sheets (MSDS)' are available Reference doc/pic no.: - C1 • Yes, the storage areas separate & ventilated properly. • No related record found at the time of audit. • No related record found at the time of audit. • No related record found at the time of audit.
General Cleanliness: • Are rooms dusted and vacuumed thoroughly and regularly? What are related checks & controls? • Does the organization ensure to use of environment-friendly, non-scented cleaning products?	• Yes, the classroom, library, staff room and other areas of the campus were found to be neat and clean at the time of the audit. • The organization does not ensure the use of the environment-friendly, no scented cleaning product.
Pest control methods & products used (check & control).	The organisation does the pest control Procedure in daily basis. Reference doc/pic no: C2
Does the organization ensure use of low emitting paints, coatings, furniture etc.? What are related checks & controls?	Paints using by the institute does not ensure the low emitting.

Is there any sign of mold infestation?	No, there is no sign of mold infestation in the organization.
Does the organization eliminate any bird or animal nests or droppings near outdoor air intakes?	No, institute does not harm or eliminate any bird or animal nests.
What are the methods adopted by the organization to control/prevent dust within the buildings?	The buildings have glass windows and greenery around them that help to prevent dust entry and there is daily dusting activity done in the Organization. Reference doc/pic no.: - C3
Related records / images	



KANSAI NEROLAC PAINTS LIMITED

MATERIAL SAFETY DATA SHEET

REF : R&D /P/WI/002/C
ISSUE NO : 02
REV NO : 03
DATE : 01.01.2015
PAGE : 01 Of 05

SECTION 1 : PRODUCT IDENTIFICATION

MANUFACTURERS ADDRESS : KANSAI NEROLAC PAINTS LTD.
M I D C PLOT NO F 3 LOTE PARSHURAM INDL AREA,
TAL : KHED. DIST : RATNAGIRI.

TRADE NAME : NEROCOAT POWDER COATING

TELEPHONE NUMBER (WORKS) : (02356) 272122 , 272133, 272134

SECTION 2 : COMPOSITION

CHEMICAL NAME OR FAMILY : POWDER PAINT PURE POLYESTER

FORMULA : NOT APPLICABLE

SECTION 3 : HAZARDOUS IDENTIFICATION

THRESHOLD LIMIT VALUE : NOT REQUIRED FOR MIXTURE.

EFFECTS OF OVER EXPOSURE : OVEREXPOSURE TO INGREDIENTS IN THIS PRODUCT MAY CAUSE NOSE AND THROAT IRRITATION, EYE IRRITATION, SKIN IRRITATION

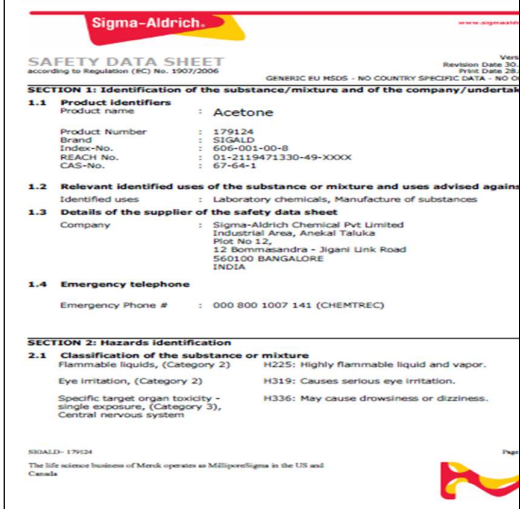
DELAYED EFFECTS (CHRONIC) : NOT KNOWN

SECTION 4 : FIRST AID MEASURES

EYE CONTACT : FLASH IMMEDIATELY WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION.

SKIN CONTACT : WASH THOROUGHLY WITH SOAP AND WATER.

CLOTHING : REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE ; THOROUGHLY. CLEAN CONTAMINATED SHOES.



Sigma-Aldrich.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO

SECTION 1: Identification of the substance/mixture and of the company/undertak

1.1 Product identifiers
Product name : Acetone

Product Number : 179124
Brand : SIGALD
Index-No. : 606-001-00-8
REACH No. : 01-2119471330-49-XXXX
CAS-No. : 67-64-1

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet
Company : Sigma-Aldrich Chemical Pvt Limited
Industrial Area, Anekal Taluka
Plot No 12,
12 Bommasandra - Jigani Link Road
560100 BANGALORE
INDIA

1.4 Emergency telephone
Emergency Phone # : 000 800 1007 141 (CHEMTREC)

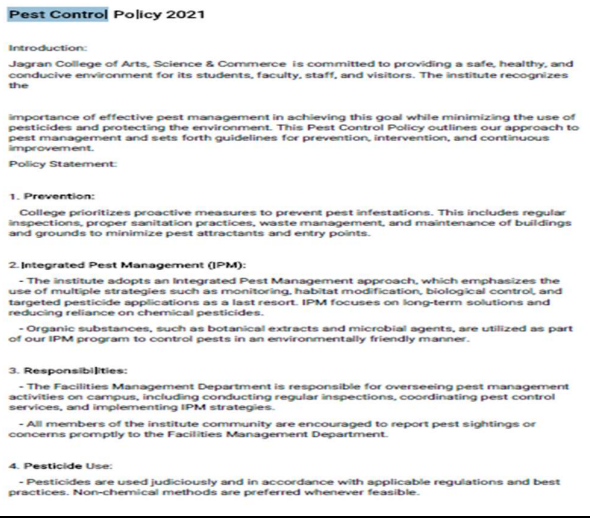
SECTION 2: Hazards identification

2.1 Classification of the substance or mixture
Flammable liquids, (Category 2) H225: Highly flammable liquid and vapor.
Eye irritation, (Category 2) H319: Causes serious eye irritation.
Specific target organ toxicity - single exposure, (Category 3), Central nervous system H336: May cause drowsiness or dizziness.

SIGALD- 179124

The life science business of Merck operates as MilliporeSigma in the US and Canada

C1. MSDS Report of paint and chemicals used in lab



Pest Control Policy 2021

Introduction:

Jagran College of Arts, Science & Commerce is committed to providing a safe, healthy, and conducive environment for its students, faculty, staff, and visitors. The institute recognizes the

importance of effective pest management in achieving this goal while minimizing the use of pesticides and protecting the environment. This Pest Control Policy outlines our approach to pest management and sets forth guidelines for prevention, intervention, and continuous improvement.

Policy Statement:

1. Prevention:

College prioritizes proactive measures to prevent pest infestations. This includes regular inspections, proper sanitation practices, waste management, and maintenance of buildings and grounds to minimize pest attractants and entry points.

2. Integrated Pest Management (IPM):

- The institute adopts an Integrated Pest Management approach, which emphasizes the use of multiple strategies such as monitoring, habitat modification, biological control, and targeted pesticide applications as a last resort. IPM focuses on long-term solutions and reducing reliance on chemical pesticides.

- Organic substances, such as botanical extracts and microbial agents, are utilized as part of our IPM program to control pests in an environmentally friendly manner.

3. Responsibilities:

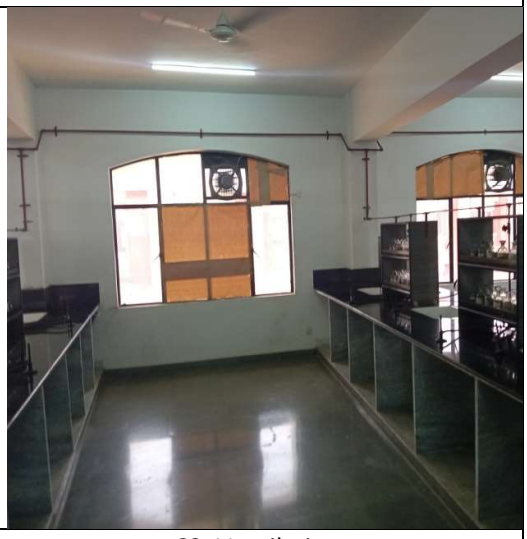
- The Facilities Management Department is responsible for overseeing pest management activities on campus, including conducting regular inspections, coordinating pest control services, and implementing IPM strategies.

- All members of the institute community are encouraged to report pest sightings or concerns promptly to the Facilities Management Department.

4. Pesticide Use:

- Pesticides are used judiciously and in accordance with applicable regulations and best practices. Non-chemical methods are preferred whenever feasible.

C2. Pest control policy



C3. Ventilation

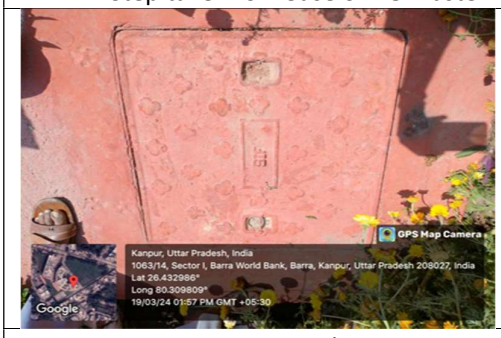
	
C4.Indoor air quality level	C5.Indoor air flow rate

Observations:

- Organization does not use of environment-friendly, non-scented cleaning products.
- Organisation does not use of low-emitting paints, coatings etc.
- Organization should have a defined system to evaluate & find out safer alternatives and should use less or nonhazardous materials used when possible.

WATER POLLUTION

Water Pollution Management (objective, practices / methods to minimize water pollution)	
Source of water pollution within the premises.	No there is no source of water pollution within the premises
Measures taken to prevent / stop water wastage.	The institute reuses RO waste water in cleaning and gardening purpose. Reference doc/pic no.: - D1
Does the institute harvest rainwater? Give details.	Yes, the institute harvests rainwater. Reference doc/pic no: D3
Is there any water recycling system? Give details.	Not Available
Is there any effluent treatment plant in premises? No. of outlets for discharge of effluent?	Not Available
What is the quality of effluent in KLD?	Not Available
Whether operating STP/ETP satisfactorily?	Not Available
Whether provided flow meters on outlet & inlet of ETP/STP?	Not Available
Whether provided separate electricity meter on ETP/STP?	Not Available
Whether maintained Logbook for consumption of Electricity/ Chemicals/Quantity of effluent?	Not Available

	Not Available
Detail of land in case effluent is discharged for percolation/ irrigation purpose with justification for its 100% utilization.	Not Available
Status of ZLD (Zero Liquid Discharge) as per CPCB	Not Available
Locate the point of entry of water and point of exit of waste water in the organisation.	The campus has a well-functioning water supply system and a closed sewer system. Reference doc/pic no.: - D2
Related records / images	
	
D1.Step taken for reuse of RO waste water	D2. Water supply point
	
D3.Rainwater harvesting	
Observations: • There should be a systematic procedure and implementation for water and wastewater management systems on campus.	

Water Consumption & Water Efficiency Use of water (indoor and outdoor water) & practices related to efficient /reduced use of water.)	
Sources of water supply	Ground Water through submersible
Number of water storage tanks and their storage capacity. Total water storage	04 No. (5000 lit per tank)

capacity.	(two tanks are reserved for fire emergencies)
Water used in irrigation	20,00 lit per day
Water used in cleaning	150 lit per day
Water used in kitchen	50 lit per day

Details	No. of persons	Domestic (liter/ day)	Flushing (liter / day)	Total (liter / day)
Students	3119	3.2	2*10=20	23.2
Teaching Staff	60	3.2	10*3=30	33.2
Technical Staff	01	3.2	10*4=40	43.20
Non-technical Staff	13	3.2	10*4=40	43.20
Outsourced Staff	07	3.7	10*5=50	53.20
Total	3195	-	-	75330

Description	Requirement*	Actual consumption
Water consumption per head /day	Without boarding facility: 45 liter per head / day With boarding facility: 135 liter per head / day	23.57
*As per Central Ground Water Authority Guidelines water requirements (Ref. NBC 2016, BIS) of an educational institute for drinking and domestic use.		

SANITARY CONVENIENCE TO BE PROVIDED

Fitments	Educational Institutes (non-Residential)				Educational Institutes (Residential)			
	Boys		Girls		Boys		Girls	
	Req.*	Actual	Req. *	Actual	Req. *	Actual	Req.	Actual
Water closets	1 per 40 pupilsor part thereof	38	1 per 25 pupilsor part thereof	44	1 for every 8 pupils or part thereof	NA	1 for every 6 pupils or part thereof	NA
Ablution taps	1 in each water closet	38	1 in each water closet	44	1 in each water closet	NA	1 in each water closet	NA
Urinals	1 per 20		-	-	1 for	NA	-	NA

	pupils				every 25 pupils or part thereof			
Wash basins	1 per 60 pupils, Min 2	20	1 per 40 pupils, Min 2	17	1 for every 8 pupils or part thereof	NA	1 for every 6 pupils or part thereof	NA
Bath	-	-	-	-	1 for every 8 pupils or part thereof	NA	1 for every 6 pupils or part thereof	NA
Drinking water fountains or taps	1 for every 50 pupils or part thereof	40	1 for every 50 pupils or part thereof	40	1 for every 50 pupils or part thereof	NA	1 for every 50 pupils or part thereof	NA
Cleaner's sinks	1 per floor, minimum							

*As per IS 1172:1993

NOISE POLLUTION

Noise Pollution Management (objective, practices / methods to minimize noise pollution)
During the recent inspection carried out by CDG at the college premises, an assessment of the ambient sound levels was conducted. The measurements taken indicated varying levels of noise, with readings recorded at 75.5 dB, 70.0 dB, 70.3 dB, and 59.4 dB. Upon averaging these readings, the overall sound level was determined to be 69 dB. The sources contributing to this ambient noise encompassed several factors. Firstly, the operational speed of fans installed within the college facilities likely played a significant role. The whirring of fan blades generates a constant hum, particularly noticeable in enclosed spaces like classrooms or corridors. Furthermore, external factors, such as the proximity of the college to a road, introduced additional noise elements. Traffic passing by, including vehicular engines, horns, and general road noise, can permeate the college environment, especially during peak hours. Additionally, other equipment like exhaust fans may have contributed to the overall noise levels. These mechanisms, crucial for ventilation and air circulation, also emit a certain level of sound during operation. Understanding the sources and levels of ambient noise is imperative for creating a conducive learning and working environment within the college premises. Addressing these factors may involve

strategies such as optimizing fan settings, implementing soundproofing measures, or considering landscaping interventions to mitigate external noise infiltration.

Noise level in dB(A) Leq	Standard Level*	Actual Level
Day Time	50	69
Nighttime	40	---

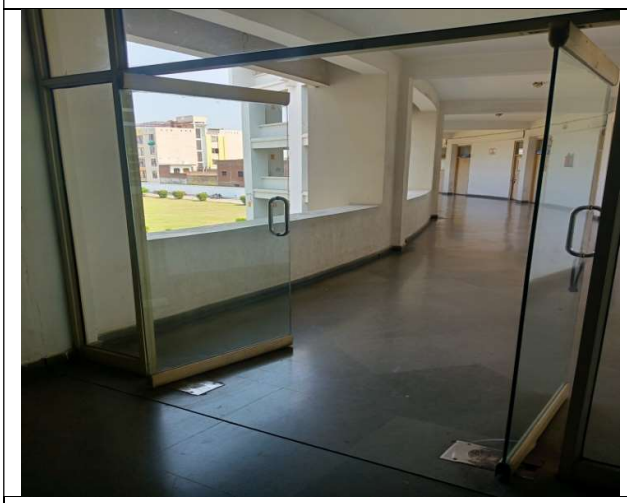
*As per The Noise Pollution (Regulation and Control) Rules, 2000; rule 3(1) and 4(1)
Day time from 6:00am to 10:00pm
Nighttime from 10:00pm to 6:00am

Related records / images

E. Noise level

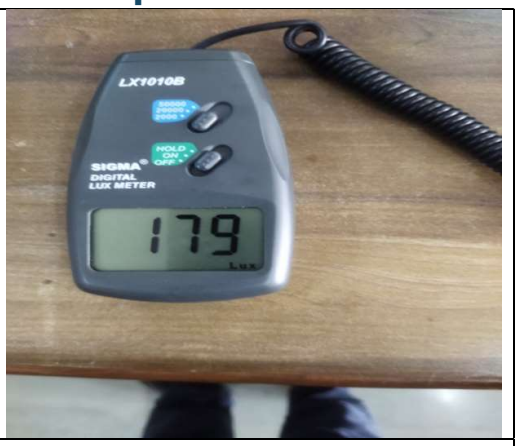
Building Sustainability

Ensure that walls, floors, roofs, and windows are as energy efficient as possible.	The walls, floors, roofs, and windows of the institute are designed to be energy efficient. Glass is usedas a building material to enhance energy efficiency by allowing in natural light and reducing the need for artificial lighting, resulting in lower electricity consumption. Reference doc/pic no.: - F1, F2
Design for good indoor air quality	Yes, every classroom, staff room, corridor, etc. comprises windows for proper ventilation. Reference doc/pic no.: - F3
Use of natural daylight in building interiors as a source of ambient light.	Yes, there is use of natural daylight in building interiors as a source of ambient light. Reference doc/pic no.: - F1, F3
Use of low emitting materials for building modifications, maintenance, and cleaning.	No record found at the time of audit.



F1. Natural light using inside campus for lighting

F2. landscaping with trees and plants

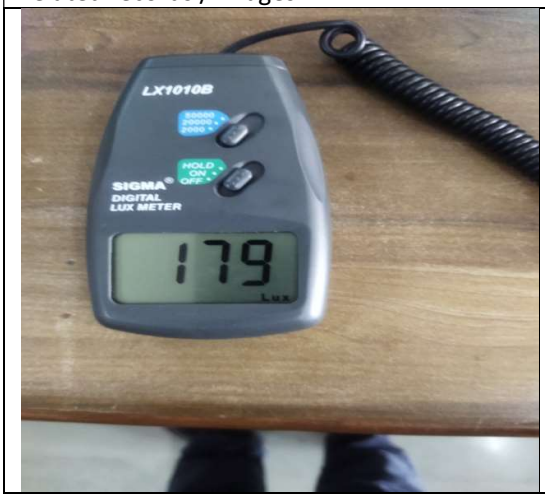
	
F3. Windows for proper ventilation and natural light	F4. LUX meter reading
Observations: The organization does not use low-emitting materials for building modifications, maintenance and cleaning.	

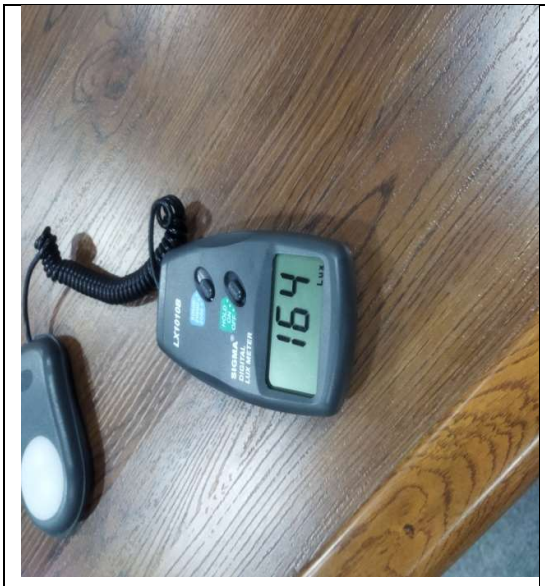
Lighting	
Use of energy efficient lighting system (bulb & other products)	LED bulbs, tube lights, and solar lights are installed on campus. By replacing conventional lighting systems with LEDs, the institute has managed to reduce its carbon emissions substantially. Reference doc/pic no: G1
Use of natural day light	Maximum utilisation Natural day light as college runs from 8 am to 5 pm. However, the office buildings and corridor lighting systems are managed using natural light Reference doc/pic no: G2
Related records / images	
	

G1. LED Light arrangement	G2. Glass window for natural light

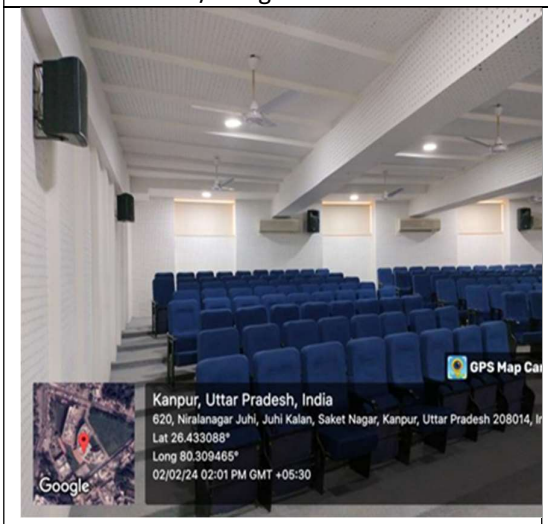
ILLUMINATION LEVELS AND GLARE INDEX

Sr. No.	Area	Standard 95Illumination (Lux)*	Standard Glare Index*	Actual Illumination (Lux)	Actual Glare Index
a)	Classrooms	300	16	280	
b)	Lecture rooms (including demonstration areas)	300	16	210	
c)	Reading rooms	150 to 300	19	295	
d)	Laboratories	300	16	179	
e)	Corridors	70	-		
f)	Libraries	300	16	102	
g)	Auditorium I. Hall II. Foyer III. Stage area	 70 70 300	 - - 16	164	
h)	Gymnasiums	150	-	xxx	
j)	Cafeterias	100	-	60	
K)	Staff rooms	150	-		
Related records / images					





*Recommended illumination Levels and Glare index as per National Lighting Code 2010 [ETD 24: Illumination Engineering and Luminaries] Part 5 Section 3

Electrical Equipment's	
Details of electrical equipment, its energy efficiency& practices	The university utilizes energy-efficient electrical equipment, including BEE star-rated Air conditioners systems and LED bulbs. Reference doc/pic no.: - H1, H2
Related records / images	
	
H1. LED Bulbs	H2. 3 star AC

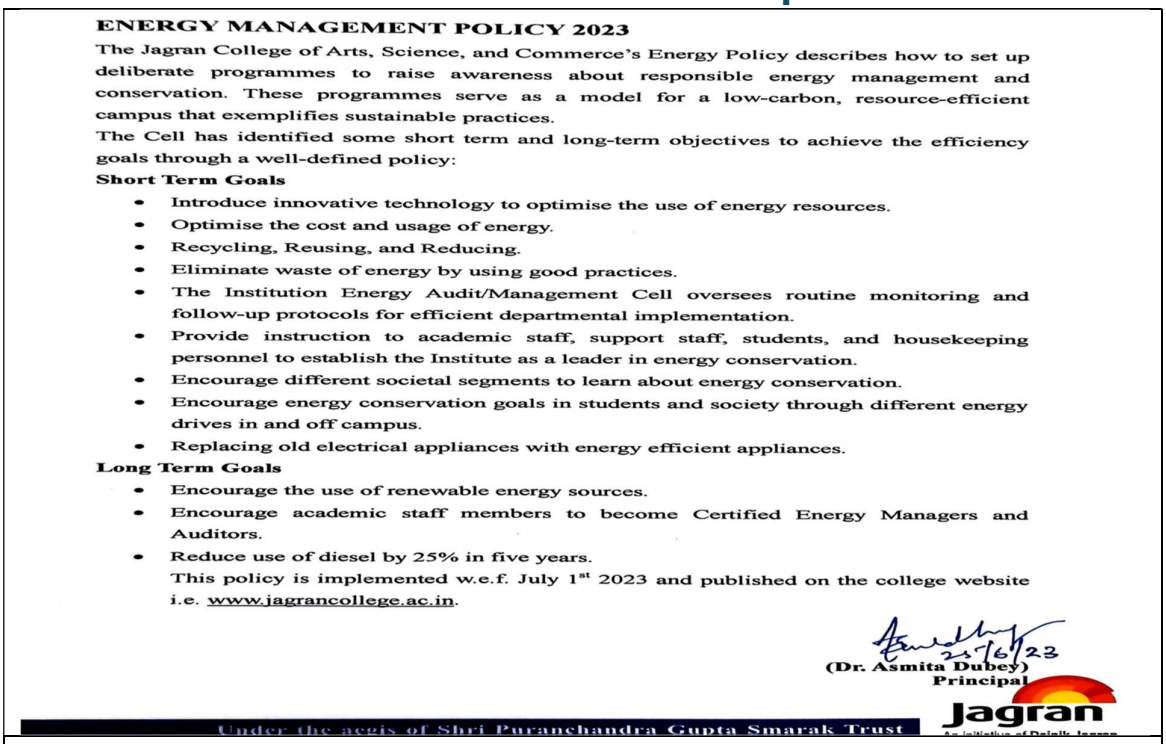
ELECTRICITY CONSUMPTION

Month	Electricity Consumption (Last 6 months)
September 23-October 23	5423.95
October 23-November 23	4087.30
November 23-December23	1712 (Two Months of electricity bill come together)
December 23-January 24	
January 24-Febuary 24	58.50
February 24-March 24	18.43
Related records / images	

I.Electric Bill

Energy Efficiency (consumption, objective, practices / methods to achieve energy efficiency objectives)	
Current energy uses.	**Energy sources** / **Consumption (Unit)** Electricity — 18.43 kWh Fuel Oil — 131.75 Gallons ***From November, 2023 solar panels of 60 kWp operating with full capacity.**
Short-term energy efficiency goals & roadmap to achieve those goals.	• Introduce innovative technology to optimise the use of energy resources. • Optimise the cost and usage of energy.

	• Recycling, Reusing, and Reducing. • Eliminate waste of energy by using good practices. • The Institution Energy Audit/Management Cell oversees routine monitoring and follow-up protocols for efficient departmental implementation. • Provide instruction to academic staff, support staff, students, and housekeeping personnel to establish the Institute as a leader in energy conservation. • Encourage different societal segments to learn about energy conservation. • Encourage energy conservation goals in students and society through different energy drives in and off campus. • Replacing old electrical appliances with energy efficient appliances. Reference doc/pic no.: -J
Long-term energy efficiency goals & roadmap to achieve those goals.	• Encourage the use of renewable energy sources. Replacement of conventional energy /power by solar energy and It's proper maintenance. • Encourage academic staff members to become Certified Energy Managers and Auditors. • Reduce use of diesel by 25% in five years. Reference doc/pic no.: -J
Related records / images	



ENERGY MANAGEMENT POLICY 2023

The Jagran College of Arts, Science, and Commerce's Energy Policy describes how to set up deliberate programmes to raise awareness about responsible energy management and conservation. These programmes serve as a model for a low-carbon, resource-efficient campus that exemplifies sustainable practices.

The Cell has identified some short term and long-term objectives to achieve the efficiency goals through a well-defined policy:

Short Term Goals

- Introduce innovative technology to optimise the use of energy resources.
- Optimise the cost and usage of energy.
- Recycling, Reusing, and Reducing.
- Eliminate waste of energy by using good practices.
- The Institution Energy Audit/Management Cell oversees routine monitoring and follow-up protocols for efficient departmental implementation.
- Provide instruction to academic staff, support staff, students, and housekeeping personnel to establish the Institute as a leader in energy conservation.
- Encourage different societal segments to learn about energy conservation.
- Encourage energy conservation goals in students and society through different energy drives in and off campus.
- Replacing old electrical appliances with energy efficient appliances.

Long Term Goals

- Encourage the use of renewable energy sources.
- Encourage academic staff members to become Certified Energy Managers and Auditors.
- Reduce use of diesel by 25% in five years.

This policy is implemented w.e.f. July 1st 2023 and published on the college website i.e. www.jagrancollege.ac.in.

25/6/23
(Dr. Asmita Dubey)
Principal

Under the aegis of Shri Puranchandra Gupta Smarak Trust

Jagran

J. Short term and long term goal

On-Site Energy Generation
(Details of renewable energy generation projects on organization's property for organization's use)

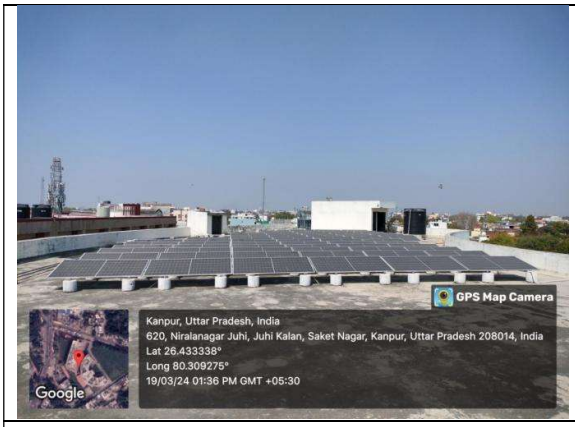
The college has taken a significant step towards sustainability by installing a rooftop solar power plant with a capacity of 60 KWp. This initiative aims to harness solar energy, thereby reducing the institution's carbon footprint and reliance on conventional energy sources. The solar modules installed on the rooftop efficiently capture sunlight and convert it into electricity, contributing to the green energy transition.

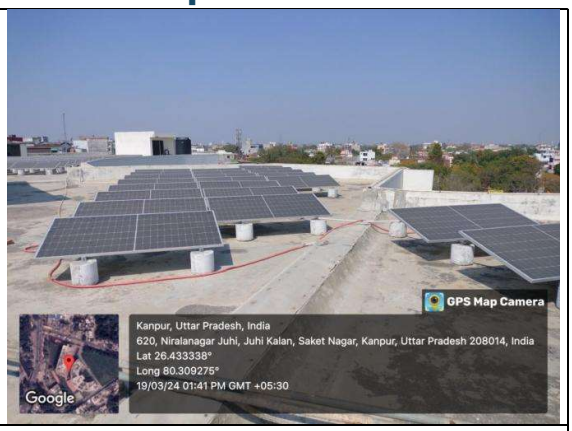
One notable feature of the system is its capability to generate surplus energy beyond the college's consumption requirements. This excess solar energy is seamlessly integrated into the grid of the local electricity distribution utility, the Kanpur Electricity Supply Company Ltd (KESCo). By exporting surplus electricity to the grid, the college not only maximizes the utilization of renewable resources but also contributes to the overall stability and sustainability of the local power infrastructure.

This initiative aligns with global efforts to mitigate climate change and promote sustainable development. Furthermore, it sets an inspiring example for other educational institutions and entities to adopt renewable energy solutions as part of their environmental stewardship and commitment to a greener future.

Reference doc/pic no: K1, K2

Related records / images





K1.Solar Power panel

K2.Electric meter

DRINKING WATER

Drinking Water Quality (As per IS 10500: 2012)
During the inspection conducted by CDG Inspection Ltd, a pH test was performed on the drinking water. The results confirmed that the water is safe for consumption, with a pH value of 7.15. This pH level falls within the acceptable range for drinking water, indicating neutrality. The assessment assures that the water meets the required quality standards, ensuring the health and safety of individuals consuming it. Regular monitoring of water quality parameters, including pH, is essential to uphold the integrity of drinking water sources and safeguard public health. Reference doc/pic no: L1
Related records / images

L1.Ph test

Observations:

The institute does not conduct drinking water quality test as per IS 10500:2012

WASTE MANAGEMENT

Type of waste – Plastic waste

Approximate annual quantity- 24 kg approx.

Source of waste – Disposable plastic items such as water bottles, food containers, utensils used in cafeterias, Office materials, and packaging materials of shipments.

Handling Methods – Implementing a comprehensive plastic recycling program by keeping designated bins for collecting plastic waste at several places. Recyclable plastic is sold to scrap merchants.

Measures to reduce the waste quantity –

Implement policies to reduce or eliminate the use of single-use plastics such as plastic straws, utensils, cups, and bottles on campus.
Encourage students, faculty, and staff to use reusable water bottles by providing refill stations across campus.
Organizing awareness campaigns by NSS to reduce plastic use.
Implement a comprehensive plastic recycling program on campus, with designated bins for collecting plastic waste.
Establish a sustainability committee or task force dedicated to reducing plastic waste on campus.

Type of waste – Paper waste

Approximate annual quantity- 320 kg approx.

Source of waste – Notes handouts, and printed materials distributed by professors during classes. Assignments, and projects submitted by students. Discarded printouts from computer labs and

libraries. Printed books, journals, periodicals, newspapers and magazines, that are no longer in circulation or are damaged. Printed documents, reports, and correspondence generated by administrative staff.

Handling Methods – The college employs a multi-faceted approach to handle paper waste, with a focus on reducing consumption, promoting reuse and recycling, and fostering a culture of sustainability within the campus community. College has established recycling programs that include paper waste. Recycling bins for paper are strategically placed across campus and paper waste is given to scrap merchants or transported to recycling facilities.

Measures to reduce the waste quantity –

Encouraging the use of email, online portals, and messaging platforms for communication between faculty, staff, and students.
Providing electronic copies of documents, announcements, and newsletters instead of printing them.
Implementing electronic submission systems for Internal exams, assignments, reports, and forms to eliminate the need for printing and photocopying.
Utilizing online platforms for document sharing, collaboration, and feedback.

Type of waste – Electronic waste

Approximate annual quantity- 10kg approx

Source of waste – Computer labs and administrative block equipped with desktop computers, monitors, printers, and other peripherals. Audiovisual equipment, projectors, interactive whiteboards, Cameras and other electronic devices used in Lecture rooms, Seminar hall and Auditorium.

Handling Methods – E-waste generated is collected and stored in the store room. All collected waste has been sold to authorized vendor. For E-waste management, college has signed a MoU with an authorized vendor of Kanpur.

Measures to reduce the waste quantity –

Encourage students, faculty and staff about reuse of electronic devices.
Promote repair services to extend their lifespan instead of discarding them when they malfunction.
Implement effective recycling programs to ensure proper disposal of electronic waste, recovering valuable materials like metals and reducing environmental impact.
Proper monitoring of E waste by lab assistant.
Use of E waste in beautification of college as CDs are used for enhancing the iron structure at college gate.
Reference doc/pic no: M1

Type of waste – Hazardous waste

Approximate annual quantity- 1-2kg approx

Source of waste – Hazardous waste in college settings can originate from limited sources across campus including the chemistry department which conducts chemical demonstrations for educational purposes (in milligram scale). Zoology laboratory generate biological waste such as cultures, specimens, and contaminated materials. Cleaning agents, solvents, and pesticides used for janitorial purposes can generate hazardous waste. Maintenance activities such as painting and

surface coating can produce hazardous waste containing volatile organic compounds (VOCs). Renovation and construction projects on campus can generate demolition debris.

Handling Methods –

Hazardous waste is identified and proper handling is done for storage in containers and disposal procedures to ensure compliance with regulations and minimize environmental and health risks. All the campus hazardous wastes are disposed of responsibly by using proper waste segregation mechanisms at the source managed by government approved and registered waste management contractors. Building debris is used for landfilling in the campus.

Measures to reduce the waste quantity –

Reducing hazardous waste quantity in college settings involves implementing strategies to minimize the generation of hazardous materials,
Promote safer alternatives as the adoption of green chemistry principles in laboratory experiments and research projects to minimize the use of hazardous chemicals.
bstitute hazardous materials with safer alternatives, such as replacing toxic solvents with water-based or non-toxic alternatives, or using non-hazardous cleaning products.

Provide comprehensive training and education to laboratory personnel, faculty, and students on hazardous waste management practices, chemical safety, and spill prevention.
Improve waste management practices by creating awareness about the environmental and health impacts of hazardous waste and the importance of waste reduction efforts.
Collaborate with other academic institutions, industry partners, and regulatory agencies to share best practices, resources, and expertise in hazardous waste reduction and management.

Type of waste – Garden waste

Approximate annual quantity- 2100 kg approx.

Source of waste – Colleges often have landscaped areas, gardens, lawns, and green spaces that require regular maintenance. This maintenance generates garden waste when plants are pruned, thinned, or replaced such as grass clippings, fallen leaves, and branches.

Handling Methods – College has a green campus and gives priority to keep the campus clean and eco-friendly. For the degradable garden waste management, we have open composting and vermi-composting unit. The leaf litter, twigs of the plants are collected for practical in Botany Department and subjected to composting. Vermi-compost is harvested and used for plants as manure in campus garden.

Measures to reduce the waste quantity –

Provide education and training on sustainable gardening practices to students, faculty, and staff. Teach techniques such as composting, mulching, and plant selection to reduce garden waste generation and promote environmental stewardship.

Type of waste – Food waste

Approximate annual quantity- 50 kg approx.

Source of waste – Food preparation areas where excess food is discarded during cooking or serving. Pre-packaged food items, such as sandwiches, pastries, and snacks, that may expire or remain unsold. Food not consumed by students in cafeterias.

Handling Methods – Food waste in college is typically handled through a combination of prevention, donation, composting, and recycling efforts. Food scraps and organic waste generated in campus dining facilities and kitchen are often collected for composting and donating to animals around the college campus.

Measures to reduce the waste quantity – Reducing food waste in college campus involves implementing various strategies to

Optimize food production and service,
Implement portion control measures
Setup on-campus composting facilities to divert food scraps and organic waste from landfills.
Educate students and staff about composting practices and provide bins for separating food waste from other waste streams.
Establishing food donation programs for humans as well as animals.

By implementing these measures, colleges can effectively handle all waste on campus while protecting human health, safety, and the environment.

Related records / images

Jagran College of Arts, Science & Commerce
620-W Block, Saket Nagar, Kanpur 208014 (U.P.) • Ph. : +91-512-2647289, 2604965
e-mail : jagrancollegeasc@gmail.com • www.jagrancollege.ac.in
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E-WASTE MANAGEMENT

The college assures that its technological use and e-waste output have no negative influence on the environment. The college aims to work towards the following goals:

- To encourage students, faculty and staff about reuse of electronic devices.
- Promote repair services to extend their lifespan instead of discarding them when they malfunction.
- Implement effective recycling programs to ensure proper disposal of electronic waste, recovering valuable materials like metals and reducing environmental impact.
- Proper monitoring and collection of E waste by lab assistant
- Proper disposal of collected e-waste
- Collaborating with industries for E-waste management by signing MoU with authorized vendors of Kanpur who can help with responsible disposal of E waste.

This policy is implemented w.e.f. July 1st 2021 and published on the college website i.e. www.jagrancollege.ac.in .

25/6/21

Under the aegis of Shri Puranchandra Gupta Smarak Trust

Jagran
An initiative of Dainik Jagran

M1. E-Waste management policy

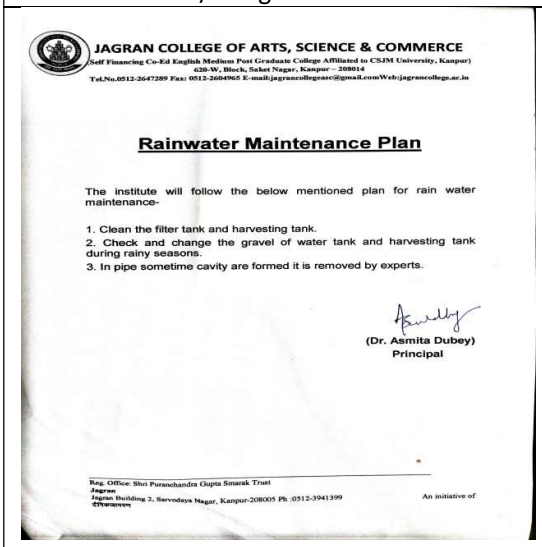
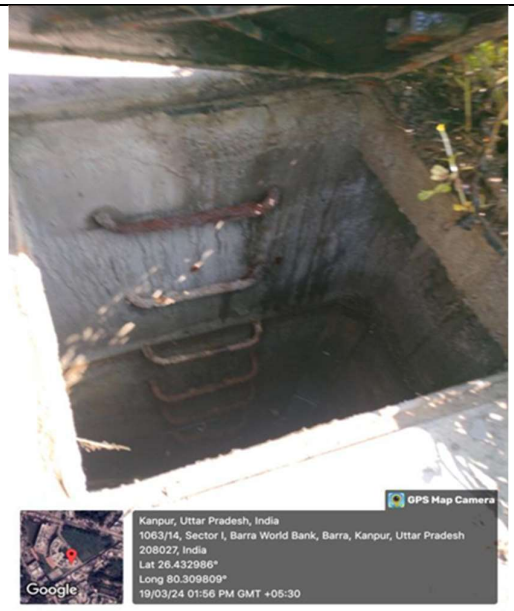
M2. dustbin

COMPOSTING PLANT

How much organic waste is generated in a day? What type of organic waste is generated?	No records found at the time of audit.
Details & capacity of compost plan installed in the organization.	No records found at the time of audit.

Details of composting method used	The organization use vermin composting method to recycle organic waste efficiently.
Compost facility maintenance & inspection plan	No records found at the time of audit.
Observations: 1. It is recommended to adopt a proper composting method for complete decomposition and can consider installing a composting machine on campus for safe and sustainable composting.	

RAINWATER HARVESTING

Provide details of the rainwater harvesting facility.	In our college campus, rainwater harvesting system has been installed near the Gate No. 4, in the playground. Reference doc/pic no.: - O2
Rainwater harvesting system maintenance plan	The roof runoff water is collected through network of pipe lines and stored in tanks. There are two tanks in the campus where the roof runoff water is stored. The roof runoff water is allowed to infiltrate in the ground for recharge. There is proper plan for the maintenance of rainwater harvesting system. Reference doc/pic no.: - O1
Related records / images	
 JAGRAN COLLEGE OF ARTS, SCIENCE & COMMERCE Self Financing Co-Ed English Medium Post Graduate College Affiliated to CSJM University, Kanpur) 620-W, Block, Saket Nagar, Kanpur – 208014 Tel.No.0512-2647289 Fax: 0512-2604965 E-mail:jagrancollegeasc@gmail.comWeb:jagrancollege.ac.in **Rainwater Maintenance Plan** The institute will follow the below mentioned plan for rain water maintenance- 1. Clean the filter tank and harvesting tank. 2. Check and change the gravel of water tank and harvesting tank during rainy seasons. 3. In pipe sometime cavity are formed it is removed by experts. (Dr. Asmita Dubey) Principal Reg. Office: Shri Puranchandra Gupta Smarak Trust Jagran Jagran Building 2, Sarvodaya Nagar, Kanpur-208005 Ph :0512-3941399 An initiative of	 GPS Map Camera Kanpur, Uttar Pradesh, India 1063/14, Sector I, Barra World Bank, Barra, Kanpur, Uttar Pradesh 208027, India Lat 26.432986° Long 80.309809° 19/03/24 01:56 PM GMT +05:30 Google
O1. Rainwater harvesting system maintenance procedure	O2. Rainwater harvesting recharge pit

Training

Has the organization provided waste management/handling training to concerned employees. Give details.	No records found at the time of audit.
Has the organization provided training for energy saving?	Yes, the organization provided training for energy saving by awareness poster. Reference doc/pic no.: - P2
Has the organization conducted training for solid waste management?	No records found at the time of audit.
Has the organization conducted awareness training for water saving?	Yes, the organization provided training for water by saving awareness poster. Reference doc/pic no.: - P1
Related records / images	
	
P1. Save water awareness poster	P2. Save Energy awareness poster
Observations: The organisation does not maintain any record regarding waste management and solid waste management training program	

Environmental Practices	
Waste recycling	Yes, food waste, canteen waste and garden waste are segregated and deposited into a compost pit. And RO water is used for cleaning and watering plants.
Waste Decomposition	Yes, food waste, canteen waste and garden waste are segregated and deposited into a compost pit. The compost is used
Rainwater harvesting	Yes, the rainwater harvesting system is installed in the campus.
Environmentally Preferable Purchasing (EPP) or Green Purchasing	The organisation uses energy efficient appliances such as LED tube-lights, bulbs and 3 star rated AC. It uses ecofriendly products for cleaning.
Distinct receptacles for trash and recycling	No records found at the time of audit.

Low-emission transportation	Yes, college encourages students to use bicycles and promote the use of battery powered vehicles.
maximum use of clean energy	Yes, solar panels and rain water harvesting has been installed for maximum use of clean energy.
Preference to electronics over the paper	Yes, online exams are conducted and projects and assignments are submitted online
Campus garden	Yes, food waste, canteen waste and garden waste are segregated and deposited into a compost pit. And RO water is used for cleaning and watering plants.

Environmental Initiatives / Green Initiatives

The organization has implemented a range of green initiatives to promote environmental sustainability and reduce its ecological footprint.

Firstly, a proactive measure has been taken by banning the use of plastic within the campus premises. This step aims to curb plastic pollution and encourage eco-friendly alternatives.

Secondly, the organization prioritizes maintaining greenery within the campus to enhance the environment. Trees, plants, and green spaces not only improve air quality but also provide aesthetic and recreational benefits to the campus community.

Thirdly, the organization is committed to adopting energy-efficient instruments across its operations. By investing in energy-efficient technologies and practices, the organization minimizes energy consumption and reduces greenhouse gas emissions.

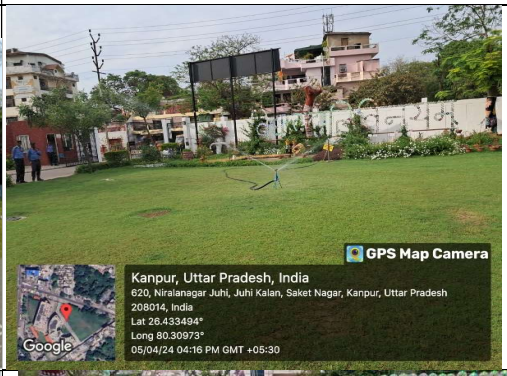
Furthermore, there has been a transition from CFL bulbs and tube lights to LED bulbs, which are more energy-efficient and have a longer lifespan. This switch not only lowers electricity usage but also decreases maintenance costs.

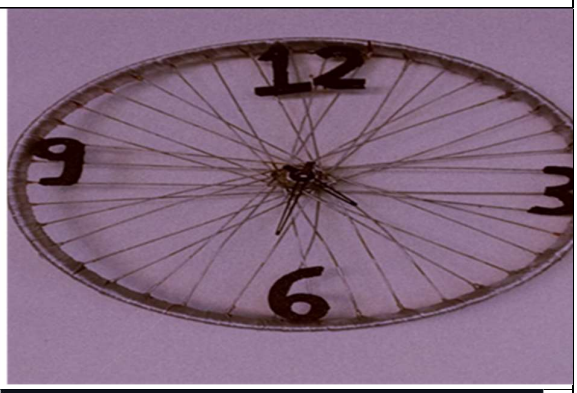
Moreover, the organization demonstrates a preference for renewable energy sources over non-renewable ones, aligning with its commitment to sustainable practices. Utilizing renewable energy contributes to mitigating climate change and reducing dependence on fossil fuels.

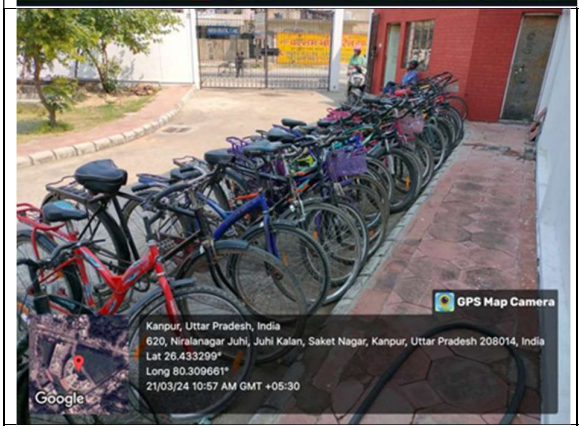
Lastly, the organization has initiated e-waste management practices to responsibly handle electronic waste and reduce pollution. Proper disposal and recycling of e-waste prevent hazardous materials from contaminating the environment and harming human health.

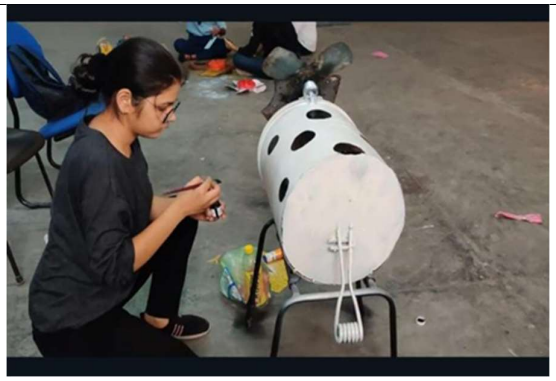
Overall, these green initiatives showcase the organization's dedication to environmental stewardship and sustainable development, setting a commendable example for others to follow.

Green Belt/ Landscaping









Ashutosh tiwari

Inspector
CDG Inspection Limited

CDG INSPECTION LIMITED APPROVED

Certificate of Inspection

Organization	:	Jagran College of Arts, Science & Commerce
Address	:	620,' W' Block, Saket Nagar, Kanpur-208014, U.P India
Inspection Standard	:	Green Audit / Environmental Audit
Date of Inspection	:	March 21st - 22nd, 2024
Inspection Report No.	:	CIL/20242262

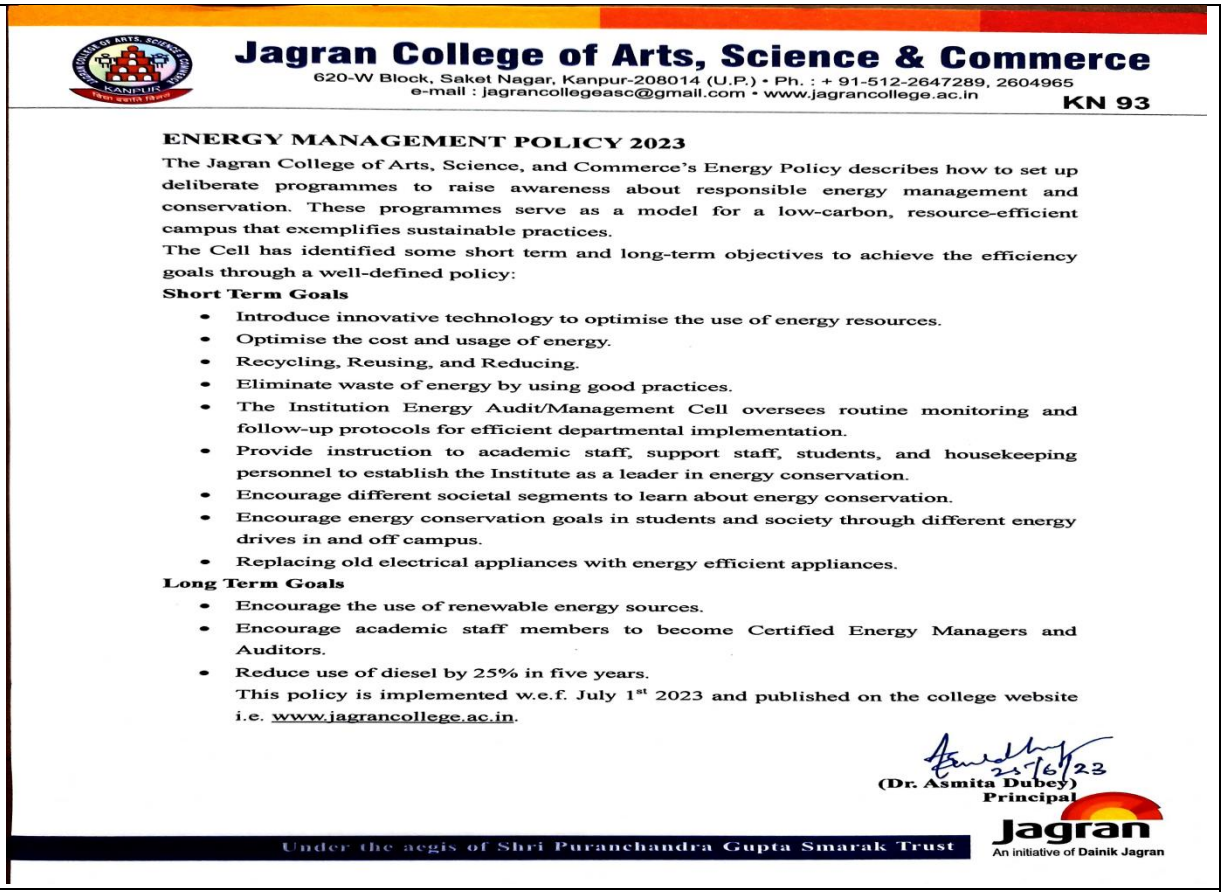
CDG Inspection Limited has conducted a green audit & environmental audit on the campus mentioned above, taking into account the relevant norms and best practices for educational institutions. For details on the audit findings, please refer to the detailed inspection report No. CIL/20242262

Managing Director
CDG INSPECTION LIMITED
W- www.cdginspection.com
E- info@cdginspection.com

ENERGY AUDIT REPORT

Name of Organization	Jagran College of Arts, Science & Commerce
Address	620,' W' Block, Saket Nagar, Kanpur-208014, U.P.
Contact Person	Dr. Asmita Dubey
Name of Auditor	Mr. Ashutosh Tiwari
Audit Date	21st and 22nd March 2024
Report No.	CIL/20242263

Energy Policy of The Organization:



Jagran College of Arts, Science & Commerce

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ENERGY MANAGEMENT POLICY 2023

The Jagran College of Arts, Science, and Commerce's Energy Policy describes how to set up deliberate programmes to raise awareness about responsible energy management and conservation. These programmes serve as a model for a low-carbon, resource-efficient campus that exemplifies sustainable practices.

The Cell has identified some short term and long-term objectives to achieve the efficiency goals through a well-defined policy:

Short Term Goals

- Introduce innovative technology to optimise the use of energy resources.
- Optimise the cost and usage of energy.
- Recycling, Reusing, and Reducing.
- Eliminate waste of energy by using good practices.
- The Institution Energy Audit/Management Cell oversees routine monitoring and follow-up protocols for efficient departmental implementation.
- Provide instruction to academic staff, support staff, students, and housekeeping personnel to establish the Institute as a leader in energy conservation.
- Encourage different societal segments to learn about energy conservation.
- Encourage energy conservation goals in students and society through different energy drives in and off campus.
- Replacing old electrical appliances with energy efficient appliances.

Long Term Goals

- Encourage the use of renewable energy sources.
- Encourage academic staff members to become Certified Energy Managers and Auditors.
- Reduce use of diesel by 25% in five years.

This policy is implemented w.e.f. July 1st 2023 and published on the college website i.e. www.jagrancollege.ac.in.

25/6/23
(Dr. Asmita Dubey)
Principal

Under the aegis of Shri Puranchandra Gupta Smarak Trust

Jagran
An initiative of Dainik Jagran

The Jagran College of Arts, Science, and Commerce's Energy Policy describes how to set up deliberate programmes to raise awareness about responsible energy management and conservation. These programmes serve as a model for a low-carbon, resource-efficient campus that exemplifies sustainable practices.

The Cell aims to achieve the following goals through the policy:

- Introduce innovative technology to optimise the use of energy resources.
- Encourage the efficient use of renewable energy sources.
- Optimise the cost and usage of energy.
- Recycling, Reusing, and Reducing.
- Eliminate waste of energy by using good practices.
- The Institution Energy Audit/Management Cell oversees routine monitoring andfollow-up protocols for efficient departmental implementation.
- Provide instruction to academic staff, support staff, students, and housekeeping personnel to establish the Institute as a leader in energy conservation.
- Encourage academic staff members to become Certified Energy Managers andAuditors.
- Encourage different societal segments to learn about energy conservation.
- Encourage energy conservation goals in students and society through differentenergy drives in and off campus.
- Review the Policy on a regular basis.

Energy Management Team:	
Dr.Asmita Dubey	Principal
Mr. A.K. Pandey	Assistant Professor, Faculty of Management
Dr. Reshma Rajani	Assistant Professor, Faculty of Commerce
Mr. Prashant Khare	Assistant Professor, Faculty of Science
Dr. Vikas Dwivedi	Assistant Professor, Faculty of Science
Mr. Santosh Singh	Support Staff, Electrician
Mr. Govind Singh	Support Staff, Electrician

Building Energy Systems

HVAC systems	
• Are there any leaks or airflow issues in the HVAC system? • How effective is the temperature control in the building?	• During the audit, it was observed that there are no leaks or airflow issues in the HVAC (Air Conditioning) system. • The temperature control in the building is effectively maintained around 28 degrees Celsius. The structure was constructed approximately eighteen years ago, with walls that are nine inches thick and a roof that is twelve feet above the ground. As a result, the building

• How much energy does the HVAC system consume? • Are there any upgrades or improvements that can be made to the HVAC system for better energy efficiency?	has adequate air and heat ventilation, which regulates its temperature. • On an average 1.8 units per hour dependingupon the running and rotation period. • Improvements to the HVAC system for better efficiency are provided in the table below.

For improving the energy efficiency of the HVAC system, several upgrades and improvements can be considered:

Upgrade to High-Efficiency HVAC Equipment: Consider replacing old HVAC units with newer, high-efficiency models. Look for units with a high Seasonal Energy Efficiency Ratio (SEER) rating for air conditioners and a high Annual Fuel Utilization Efficiency (AFUE) rating for furnaces.
Regular Maintenance: Implement a regular maintenance schedule for HVAC equipment to ensure optimal performance. This includes cleaning or replacing filters, checking for leaks in ducts, and tuning up the system.
Programmable Thermostats: Install programmable thermostats to better control the temperature in different zones of the building and reduce energy consumption during unoccupied times.
Improved Insulation: Ensure that the building is properly insulated to reduce heat loss in winter and heat gain in summer, which can help HVAC systems work more efficiently.
Sealing Ducts: Inspect and seal any leaks in the HVAC ductwork to prevent air loss, which can improve system efficiency.
Natural Ventilation: Where feasible, consider incorporating natural ventilation strategies to reduce the need for mechanical cooling or heating.
Energy Recovery Ventilation (ERV): Install ERV systems to recover heat or coolness from exhaust air and transfer it to incoming fresh air, reducing the load on the HVAC system.
Zoning Systems: Implement zoning systems to heat or cool only the areas that are in use, rather than the entire building, which can lead to energy savings.
Occupancy Sensors: Use occupancy sensors to control HVAC systems in areas that are not constantly occupied, ensuring that energy is not wasted on heating or cooling unoccupied spaces.
Educational Programs: Implement educational programs for building occupants to encourage energy-saving behaviors, such as setting thermostats to energy-efficient temperatures and turning off lights when not in use.
Implementing these recommendations can help improve the energy efficiency of the HVAC system and reduce energy costs for the college.

Lighting systems	
• Are the lighting fixtures and bulbs in	• The lighting fixtures and bulbs in use

use energy-efficient? • How much energy does the lighting system consume? • Are there any areas where lighting can be improved or upgraded for better energy efficiency?	are energy-efficient, represented by LED lights, tube lights, and CFL bulbs in minimum quantity. Reference fig/ doc - Table 1 • Major consumptions are reduced by using LED lights and higher rating Fans and ACs.Approximately 72 unit consume in day by lighting system. Reference fig/ doc - Table 1 • The areas where lighting can be improved or upgraded for better energy efficiency are listed below:

To improve lighting energy efficiency in the college, consider the following upgrades and improvements:

LED Lighting: Replace traditional incandescent, fluorescent, or HID lights with energy-efficient LED fixtures. LEDs consume less energy and have a longer lifespan, reducing maintenance costs.
Lighting Controls: Install occupancy sensors, daylight sensors, and timers to automatically control lighting based on occupancy and natural light levels. This ensures lights are only on when needed.
Task Lighting: Encourage the use of task lighting in work areas to provide focused lighting where it's needed, reducing the need for overhead lighting.
Natural Light Utilization: Maximize the use of natural light through skylights, windows, and light shelves. This can reduce the need for artificial lighting during daylight hours.
Lighting Layout Optimization: Ensure that lighting fixtures are properly spaced and oriented to provide adequate illumination without over-lighting spaces.
Lighting Maintenance: Implement a regular maintenance program to clean fixtures, replace lamps, and ensure that lighting systems are operating at peak efficiency.
Energy-Efficient Ballasts and Drivers: Use electronic ballasts and drivers for fluorescent and LED lighting, respectively, to improve energy efficiency and lamp life.
Use of Controls and Dimmers: Install dimmer switches and lighting controls to adjust light levels based on specific needs, further reducing energy consumption.
Exit Sign Efficiency: Replace incandescent exit signs with LED exit signs, which consume less energy and last longer.
Education and Awareness: Educate building occupants about the importance of turning off lights when leaving a room and other energy-saving practices.
Implementing these lighting upgrades and improvements can significantly reduce energy consumption and costs while maintaining adequate lighting levels for the college.

Plug loads:	
• Evaluate the usage of electrical equipment and appliances, such as computers, printers, and vending machines. • Analyze energy usage and identify areas for improvement. • Recommend energy-efficient replacements or upgrades.	• The organization uses electrical equipment such as computers, printers, and does not have vending machines. Reference fig/doc/table: - Table 1 • The organization has 85 computers consuming about 5950 watts, 5 printers consuming about 1700 watts of electricity, and no vending machines. Reference fig/doc/table: - Table 1 • Recommended energy-efficient replacements or upgrades are given in the table below.

To recommend energy-efficient replacements or upgrades for computers, printers, and vending machines, consider the following:

Computers:
Replace old desktop computers with Energy Star certified models, which are designed to be more energy efficient.
Consider using laptops instead of desktops, as they generally consume less energy.
Enable power management settings on computers to automatically switch to sleep mode when not in use.
Printers:
Replace old printers with Energy Star certified printers, which are more energy efficient.
Use multi-function printers (MFPs) that can print, scan, and copy to reduce the number of devices in use.
Enable duplex (double-sided) printing to reduce paper usage and energy consumption.
Vending Machines:
Replace old vending machines with newer, more energy-efficient models that have features like LED lighting and energy-saving modes.
Use vending machine controllers that can optimize energy use based on usage patterns and environmental conditions.
Consider vending machines that offer more energy-efficient cooling options, such as those using natural refrigerants.
General Recommendations:
Implement an energy management plan that includes regular maintenance and monitoring of these devices to ensure they are operating efficiently.

Educate users about energy-saving practices, such as turning off devices when not in use and using power-saving settings.
By implementing these recommendations, the college can reduce energy consumption and save on operating costs while maintaining the functionality of these devices.

Water heating systems:	
Inspect water heating equipment, including boilers and water heaters. Check for leaks in pipes. Review temperature setpoints and scheduling. Analyze energy usage and identify areas for improvement. Recommend upgrades or replacements as necessary.	Not Applicable

To improve the energy efficiency of water heating systems in the college, consider the following upgrades or replacements:

High-Efficiency Water Heaters: Replace old, inefficient water heaters with high-efficiency models. Consider options like heat pump water heaters, which can be more energy efficient than traditional electric or gas water heaters.
Solar Water Heating Systems: Install solar water heating systems to use renewable energy from the sun to heat water. These systems can significantly reduce energy consumption for water heating.
Tankless Water Heaters: Consider replacing traditional water heaters with tankless (on-demand) water heaters. Tankless heaters heat water only when it is needed, avoiding standby energy losses associated with traditional tank heaters.
Insulation and Pipe Lagging: Ensure that water heaters and hot water pipes are properly insulated to reduce heat loss and improve energy efficiency.
Temperature Control: Install temperature control devices to ensure that water is heated to the desired temperature without unnecessary energy consumption.
Regular Maintenance: Implement a regular maintenance program for water heaters to ensure they are operating efficiently and to address any issues promptly.
Water Heater Sizing: Ensure that water heaters are sized appropriately for the college's hot water demand to avoid unnecessary energy consumption.
Water Heater Location: Consider the location of water heaters to minimize heat loss and ensure that hot water reaches the desired areas efficiently.
By implementing these upgrades or replacements, the college can improve the energy efficiency

of its water heating systems and reduce energy costs.

Other energy-consuming equipment:	
• Evaluate other energy-consuming equipment, such as elevators, escalators, and data centers. • Analyze energy usage and identify areas for improvement. • Recommend energy-efficient replacements or upgrades.	• No record found at the time of audit. • No record found at the time of audit. • Recommended energy-efficient replacements or upgrades are given in the following table

For energy-efficient replacements or upgrades for elevators, escalators, and data centers, consider the following recommendations: Elevators: Replace older elevators with newer, more energy-efficient models that use regenerative drives to capture and reuse energy during operation. Install energy-efficient lighting in elevator cars and shafts, such as LED lighting, and use motion sensors to control lighting usage. Implement elevator scheduling systems that optimize elevator usage to reduce energy consumption. Escalators: Consider replacing traditional escalators with energy-efficient models that use variable speed drives and LED lighting. Implement escalator controllers that can adjust speed based on traffic flow to reduce energy consumption during low-traffic periods. Data Centers: Upgrade to energy-efficient servers and IT equipment that are designed to minimize energy consumption. Implement virtualization and consolidation strategies to reduce the number of physical servers needed, thereby reducing energy consumption. Use energy-efficient cooling systems, such as air-side economizers or liquid cooling, to reduce the energy required for cooling the data center. Optimize airflow management within the data center to ensure that cool air reaches IT equipment efficiently. General Recommendations: Implement energy management systems to monitor and control energy usage in these systems. Conduct regular energy audits to identify areas for improvement and track energy savings over

time.
Educate users and maintenance staff about energy-saving practices and the importance of energy efficiency in these systems.
By implementing these recommendations, the college can improve the energy efficiency of its elevators, escalators, and data centers, leading to reduced energy costs and environmental impact.

Nonconformity :-
The organization does not have accurate information regarding energy-consuming equipment, such as elevators, escalators, and data centers

Building Envelope

Walls, roof, and foundation:	
• Inspect walls, roof, and foundation for air leaks, cracks, and damage. • Check for insulation and evaluate its R-value. • Review construction materials and building design. • Analyze energy usage and identify areas for improvement. • Recommend upgrades or replacements as necessary.	• During the audit, it was observed that the wall, roof, and foundation were free from air leaks, cracks, and damage. • No record found at the time of audit. • The construction material and building design are satisfactory. • The energy usage of the building is found to be satisfactory and can be improved. Recommended upgrades or replacements, as necessary, are given below

To improve the energy efficiency of the college's building envelope (walls, roof, and foundation), consider the following upgrades or replacements:

Walls:
Upgrade insulation in exterior walls to reduce heat transfer and improve energy efficiency.
Consider adding insulation to cavity walls or installing external insulation (e.g., EIFS).
Seal gaps and cracks in walls to prevent air leakage, which can significantly impact heating and cooling loads.
Roof:
Install a cool roof coating or reflective roofing material to reduce heat absorption and lower cooling loads.
Improve roof insulation to prevent heat loss in winter and reduce heat gain in summer. Consider adding a layer of rigid foam insulation above the roof deck.
Foundation:
Insulate foundation walls to reduce heat loss from below-grade spaces. This can be done by

adding insulation to the interior or exterior of foundation walls.
Seal foundation cracks and gaps to prevent air leakage and moisture infiltration.
Windows and Doors:
Upgrade windows and doors to energy-efficient models with low-e coatings and insulated frames to reduce heat transfer.
Consider installing double or triple-pane windows for better insulation.
General Recommendations:
Conduct an energy audit to identify specific areas for improvement and prioritize upgrades based on cost-effectiveness.
Implement air sealing measures throughout the building envelope to reduce air leakage and improve overall energy efficiency.
Consider using sustainable and eco-friendly materials for upgrades and replacements to minimize environmental impact.
By implementing these upgrades or replacements, the college can improve the energy efficiency of its building envelope, reduce energy consumption, and create a more comfortable and sustainable campus environment.

Nonconformity :-

Lack of written documentation of the Walls, roof, and foundation of insulation R-value and effectiveness at the college.

Insulation:

• Evaluate the type and condition of insulation. • Check for gaps or damaged areas. • Evaluate insulation's R-value and its effectiveness. • Analyze energy usage and identify areas for improvement. • Recommend upgrades or replacements as necessary. • Recommend upgrades or replacements as necessary.	• The type and condition of insulation during the audit were found to be satisfactory. • No gaps or damaged areas were found during the audit. • No written evidence was found during the audit regarding the insulation R-value of the wire. • The energy usage in the building is satisfactory but can be improved. The upgrades or replacements, as necessary, are listed in the following table.

To improve the energy efficiency and safety of the electrical wiring in the college, consider the following upgrades or replacements:

Upgrade to Energy-Efficient Wiring:
Consider replacing old, inefficient wiring with newer, more energy-efficient options, such as copper-clad aluminum (CCA) or aluminum conductors with larger diameters, which can reduce energy loss and improve efficiency.

Install Proper Insulation:
Ensure that wiring is properly insulated to prevent energy loss and reduce the risk of electrical fires. Use insulation materials that are appropriate for the specific application and environment.
Use Energy-Efficient Lighting:
Replace traditional lighting fixtures with energy-efficient LED fixtures, which consume less energy and have a longer lifespan.
Implement Energy Management Systems:
Install energy management systems that can monitor and control energy usage in the building, including lighting and other electrical systems.
Regular Maintenance:
Implement a regular maintenance program for electrical wiring to ensure that it is in good condition and operating efficiently. This includes checking for signs of wear or damage and addressing any issues promptly.
Upgrade to Smart Wiring:
Consider upgrading to smart wiring systems that can be controlled remotely and programmed to optimize energy usage based on occupancy and other factors.
Consider Renewable Energy Sources:
Explore the possibility of integrating renewable energy sources, such as solar panels or wind turbines, into the electrical system to reduce reliance on grid electricity.
Educational Programs:
Educate building occupants about the importance of energy efficiency and ways to reduce energy consumption, such as turning off lights and unplugging devices when not in use.
By implementing these upgrades or replacements, the college can improve the energy efficiency and safety of its electrical wiring, reduce energy costs, and create a more sustainable campus environment.

Nonconformity :-

Lack of written documentation for the wire's insulation R-value and effectiveness at the college.

Doors and windows:

• Inspect doors and windows for air leaks, damage, or gaps. • Evaluate the type and condition of windows and doors. • Review the window-to-wall ratio and the orientation of windows. • Analyze energy usage and identify areas for improvement. • Recommend upgrades or replacements as necessary.	• During the audit, it was observed that the doors and windows were checked for any leaks, damage, or gaps. • The condition of windows and doors, made from materials such as wood, PVC, and glass are provided. Reference fig/doc:- Appendix table 2 • window to wallratio is 1:3 • The energy usage by the

	organization is found to be satisfactory but can be improved. The recommended upgrades or replacements, as necessary, are provided in the table below

To improve the energy efficiency and comfort of the college's buildings, consider the following upgrades or replacements for doors and windows:

Upgrade to Energy-Efficient Windows:
Replace old, single-pane windows with energy-efficient windows that have double or triple glazing. Look for windows with low-emissivity (low-e) coatings to reduce heat transfer.
Consider installing windows with gas fills (such as argon or krypton) between the panes for better insulation.
Install Energy-Efficient Doors:
Replace old, inefficient doors with energy-efficient models that have good insulation properties.
Look for doors with energy-efficient cores and weather stripping to prevent air leakage.
Consider installing automatic door closers to ensure that doors are not left open, which can lead to energy loss.
Improve Sealing and Weather-stripping:
Ensure that doors and windows are properly sealed and weather-stripped to prevent air leakage, which can significantly impact heating and cooling costs.
Consider High-Performance Frames:
Choose window and door frames made from energy-efficient materials, such as fiberglass, vinyl, or wood-clad with a low conductivity material.
Use Solar Control Strategies:
Install external shading devices, such as awnings or overhangs, to reduce solar heat gain through windows in the summer.
Consider installing reflective films or coatings on windows to reduce heat gain while maintaining visibility.
Upgrade to Smart Windows:
Consider installing smart windows that can change tint based on external conditions to control heat and light transmission.
Consider Natural Ventilation Options:
Install windows that can be opened to allow for natural ventilation, reducing the need for mechanical cooling in mild weather.
Educational Programs:
Educate building occupants about the importance of energy efficiency and how they can contribute by keeping doors and windows closed when heating or cooling is in use.
By implementing these upgrades or replacements, the college can improve the energy efficiency of its buildings, reduce energy costs, and create a more comfortable and sustainable campus environment.

Air leaks:	
• Identify areas of air leakage in the building envelope. • Evaluate the effectiveness of weatherstripping and caulking. • Recommend upgrades or replacements as necessary.	• During the audit, it was observed that the building envelope has been developed, as there is no air leakage. • No written evidence was found regarding the effectiveness of weather-stripping and caulking. The recommended upgrades or replacements, as necessary, are provided in the table below.

To address air leaks and improve the energy efficiency of the college's buildings, consider the following upgrades or replacements:

Air Sealing:
Conduct a thorough inspection to identify and seal air leaks around windows, doors, electrical outlets, pipes, and other penetrations in the building envelope.
Use caulking, weatherstripping, and foam sealants to seal gaps and cracks in the building envelope to prevent air leakage.
Insulation:
Ensure that the building is properly insulated to reduce heat transfer and improve energy efficiency. Focus on areas such as attics, walls, and floors.
Duct Sealing:
Seal ductwork to prevent air leaks in the HVAC system. Leaky ducts can significantly reduce the efficiency of heating and cooling systems.
Window and Door Upgrades:
Consider upgrading to energy-efficient windows and doors that have good insulation properties and are less prone to air leakage.
Ventilation:
Ensure that the building has adequate ventilation to maintain indoor air quality while minimizing energy loss. Consider installing energy recovery ventilation (ERV) systems to recover heat or coolness from exhaust air.
Use of Air Barriers:
Install air barriers, such as membranes or sheathing, in the building envelope to prevent air leakage and improve energy efficiency.
Regular Maintenance:
Implement a regular maintenance program to identify and address air leaks promptly. This includes checking for signs of wear or damage in building components that could lead to air leakage.

Energy Audits:
Conduct periodic energy audits to identify areas of improvement and track energy savings over time. This can help prioritize upgrades and replacements to maximize energy efficiency.
By implementing these upgrades or replacements, the college can reduce air leakage, improve energy efficiency, and create a more comfortable and sustainable campus environment.

Nonconformity :-
Lack of written documentation for the effectiveness of weather-stripping and caulking at the college.

Occupant Behavior

Temperature set points:	
• Evaluate temperature setpoints for different areas of the building. • Review thermostat settings and schedules. • Identify opportunities to adjust temperature setpoints to optimize energy efficiency while maintaining occupant comfort.	• The temperature set point for different areas of the building is 28 degrees Celsius. • No written evidence was found for thermostat settings and schedules. • The opportunities to adjust the temperature set point to optimize energy efficiency while maintaining occupant comfort are given in the table below.

To optimize energy efficiency while maintaining occupant comfort, consider the following opportunities to adjust temperature setpoints:

Heating Setpoints:
During the heating season, consider lowering the thermostat by a few degrees while the building is unoccupied or during nighttime hours.
Use programmable thermostats to automatically adjust the temperature based on occupancy schedules, ensuring that the building is comfortable when occupied and saving energy when unoccupied.
Cooling Setpoints:
During the cooling season, consider raising the thermostat by a few degrees while the building is unoccupied or during nighttime hours.
Use programmable thermostats or smart HVAC controls to adjust the temperature based on occupancy patterns and outdoor temperature conditions.
Temperature Zoning:

Implement temperature zoning to allow different areas of the building to be heated or cooled to different setpoints based on occupancy and comfort requirements.
Occupant Comfort Surveys:
Conduct surveys or feedback sessions with building occupants to understand their comfort preferences and adjust temperature setpoints accordingly.
Use of Natural Ventilation:
Take advantage of natural ventilation opportunities, such as opening windows during mild weather, to reduce the need for mechanical heating or cooling.
Adjustments for Seasonal Changes:
Adjust temperature setpoints seasonally to account for changes in outdoor temperature and humidity levels.
Educational Programs:
Educate building occupants about energy-saving practices and the importance of adjusting temperature setpoints to optimize energy efficiency while maintaining comfort.
By implementing these strategies, the college can optimize energy efficiency while ensuring that building occupants remain comfortable, leading to reduced energy costs and environmental impact.

Nonconformity :-

Absence of written documentation for thermostat settings and schedules at the college.

Lighting usage:

• Evaluate lighting usage and habits. • Review the availability of natural lighting and its use. • Identify opportunities to optimize lighting usage to reduce energy consumption.	• Lighting is used minimally due to the college's operating hours being during the daytime, maximizing the utilization of natural light. Additionally, LED lights and tube lights are only operated during college hours. Reference fig/doc:- Table 1 • Due to the open layout and design of the corridor, natural light is maximally utilized. Opportunities to optimize lighting usage to reduce energy consumption are provided in the table below.

To optimize lighting usage and reduce energy consumption, consider the following opportunities:

Use of Natural Light:
Take advantage of natural light by positioning work areas near windows and using skylights or light shelves to distribute natural light deeper into the building.
Daylight Harvesting:

Use daylight harvesting systems that automatically dim or switch off artificial lighting in response to natural light levels, reducing energy consumption.

Occupancy Sensors:

Install occupancy sensors in areas with intermittent use, such as restrooms, conference rooms, and corridors, to ensure that lights are only on when needed.

Task Lighting:

Encourage the use of task lighting in work areas to provide focused lighting where it is needed, reducing the need for overhead lighting.

LED Lighting:

Replace traditional incandescent, fluorescent, or HID lights with energy-efficient LED fixtures, which consume less energy and have a longer lifespan.

Lighting Controls:

Use lighting controls, such as timers, dimmers, and programmable switches, to adjust lighting levels based on occupancy and time of day.

Maintenance:

Implement a regular maintenance program to clean fixtures, replace lamps, and ensure that lighting systems are operating at peak efficiency.

Education and Awareness:

Educate building occupants about the importance of turning off lights when not in use and using natural light whenever possible to reduce energy consumption.

Energy Audits:

Conduct energy audits to identify opportunities for improving lighting efficiency and track energy savings over time.

By implementing these strategies, the college can optimize lighting usage, reduce energy consumption, and create a more sustainable campus environment.

Equipment usage:

• Evaluate the usage of electrical equipment and appliances, such as computers, printers, and vending machines. • Review the availability of energy-efficient equipment. • Identify opportunities to optimize equipment usage to reduce energy consumption.	• The usage of electrical equipment and appliances, such as computers, printers, and vending machines, is detailed in the table below, indicating operation for 5 to 6 hours on a typical workday. All the equipment used on campus has an energy-saving star rating to reduce electricity consumption. Reference fig/doc:- Appendix table 2 • The opportunity to optimize equipment usage to reduce energy consumption is provided below.

To optimize equipment usage and reduce energy consumption, consider the following opportunities:

Energy-Efficient Equipment:
Replace old, inefficient equipment with newer, energy-efficient models that have high Energy Star ratings.
Equipment Scheduling:
Implement scheduling systems to ensure that equipment is only used when needed, especially for equipment with high energy consumption.
Power Management Settings:
Enable power management settings on computers, printers, and other electronic devices to reduce energy consumption during periods of inactivity.
Equipment Maintenance:
Implement a regular maintenance program to ensure that equipment is operating efficiently. This includes cleaning or replacing filters, lubricating moving parts, and checking for leaks.
Occupancy Sensors:
Use occupancy sensors to control lighting, heating, and cooling systems in areas that are not constantly occupied, ensuring that energy is not wasted.
Energy Audits:
Conduct energy audits to identify opportunities for improving equipment efficiency and track energy savings over time.
Education and Awareness:
Educate building occupants about the importance of using equipment efficiently and turning off equipment when not in use to reduce energy consumption.
Remote Monitoring and Control:
Implement remote monitoring and control systems to manage equipment usage and energy consumption more effectively.
Load Management:
Implement load management strategies to distribute energy usage more evenly throughout the day, reducing peak demand charges.
By implementing these strategies, the college can optimize equipment usage, reduce energy consumption, and lower operating costs.

Education and awareness:	
• Evaluate educational programs for building occupants regarding energy efficiency and sustainability. • Review the availability of resources to educate occupants on energy-saving	• The educational program for buildings regarding energy efficiency and sustainability is conducted through seminars organized within the organizational structure. • Resources are available for education,

practices. • Identify opportunities to promote awareness and encourage energy-efficient behaviors among building occupants.	and they can be further enhanced to improve efficiency among building occupants. • The opportunity to promote awareness and encourage energy-efficient behavior among building occupants is provided in the table below.

To promote awareness and encourage energy-efficient behaviors among building occupants, consider the following opportunities:

Education and Training:
Provide educational materials, workshops, and training sessions to inform occupants about energy-saving practices and the benefits of energy efficiency.
Energy Awareness Campaigns:
Launch energy awareness campaigns to engage occupants and encourage them to adopt energy-efficient behaviors. This could include posters, emails, and social media campaigns.
Occupant Engagement Programs:
Create programs that incentivize occupants to save energy, such as energy-saving competitions, rewards for reducing energy consumption, or recognition for energy-saving achievements.
Feedback and Monitoring:
Provide feedback to occupants on their energy consumption, such as through energy dashboards or regular updates, to raise awareness and encourage behavior change.
Green Teams:
Establish green teams or committees comprised of building occupants to promote sustainability initiatives, including energy efficiency.
Operational Policies:
Implement operational policies, such as turning off lights and equipment when not in use, setting thermostats to energy-efficient temperatures, and using natural ventilation when possible.
Energy-Efficient Practices:
Encourage energy-efficient practices, such as using natural light, adjusting thermostat settings, and unplugging devices when not in use.
Collaboration and Communication:
Foster a culture of collaboration and communication among occupants to share energy-saving tips and best practices.
Recognition and Rewards:
Recognize and reward occupants who demonstrate energy-efficient behaviors, such as through awards or incentives.
By implementing these strategies, the college can promote awareness and encourage energy-efficient behaviors among building occupants, leading to reduced energy consumption and a more sustainable campus environment.

Energy Bills &Utility Data

Energy bills:	
• Collect energy bills for the past 12 months. • Review energy bills to identify usage patterns and trends. • Analyze energy bills to identify peak usage periods and potential areas for improvement.	• During the 12-month audit process, energy bills were collected and their analysis suggests that the units consumed amounted to 82,426 unit, costing ₹ 6,59,406/- Reference fig/doc:- Table 2 • Energy bills were analyzed to identify usage patterns and trends, showing that from July to November, the peak is high, while in the rest of the months, it remains lower. Reference fig/doc:- Table 2 The peak usage period and potential areas for improvement of the energy bills are provided for the time in the table below.

To analyze energy bills and identify peak usage periods and potential areas for improvement, follow these steps:

Gather Energy Bills: Collect energy bills for the past 12-24 months, including electricity, gas, and any other relevant utilities.
Review Billing Data: Analyze the billing data to identify patterns and trends in energy consumption. Look for spikes or peaks in usage that may indicate high-demand periods.
Identify Peak Usage Periods: Use the billing data to identify peak usage periods, such as certain months or times of day when energy consumption is highest.
Compare Usage to Previous Periods: Compare current energy usage to previous periods to identify any significant increases or changes in consumption.
Consider External Factors: Take into account external factors that may influence energy usage, such as changes in occupancy, weather patterns, or operational changes.
Identify Potential Areas for Improvement: Based on the analysis, identify potential areas for improvement, such as upgrading equipment, improving insulation, or implementing energy-saving practices.
Recommendations for Improvement: Develop recommendations for improvement based on the analysis, focusing on strategies that can reduce energy consumption during peak usage periods.
Implement Energy-Saving Measures: Implement the recommended energy-saving measures, and

monitor energy bills to assess the impact of the improvements over time.
Continuous Monitoring and Adjustment: Continuously monitor energy bills and usage patterns to identify further opportunities for improvement and make adjustments as needed.
By analyzing energy bills and identifying peak usage periods and potential areas for improvement, the college can develop targeted strategies to reduce energy consumption and save costs.

Utility data:

• Collect utility data, including gas, water, and electricity usage. • Review utility data to identify usage patterns and trends. • Analyze utility data to identify peak usage periods and potential areas for improvement.	• Electricity data and gas are provided, but data for other utilities such as water is not provided. Reference fig/doc:- Appendix table • No written document was found during the audit. The utility data is needed to identify peak usage periods and areas for improvement, as given below

Analyzing utility data to identify peak usage periods and potential areas for improvement involves several steps:

Gather Utility Data: Collect utility data for the relevant period, including electricity, gas, water, and any other utilities used by the college.
Organize Data: Organize the utility data by month, week, or day, depending on the level of detail needed for analysis.
Identify Peak Usage Periods: Use the utility data to identify peak usage periods for each utility. Look for patterns and trends in usage that indicate high-demand periods.
Compare Usage to Previous Periods: Compare current utility usage to previous periods to identify any significant increases or changes in consumption.
Consider External Factors: Take into account external factors that may influence utility usage, such as changes in occupancy, weather patterns, or operational changes.
Identify Potential Areas for Improvement: Based on the analysis, identify potential areas for improvement, such as upgrading equipment, improving insulation, or implementing water-saving measures.
Develop Recommendations for Improvement: Develop recommendations for improvement based on the analysis, focusing on strategies that can reduce utility consumption during peak periods.
Implement Energy-Saving Measures: Implement the recommended energy-saving measures, and monitor utility data to assess the impact of the improvements over time.
Continuous Monitoring and Adjustment: Continuously monitor utility data and usage patterns to identify further opportunities for improvement and make adjustments as needed.

By analyzing utility data to identify peak usage periods and potential areas for improvement, the college can develop targeted strategies to reduce utility consumption and save costs.

Cost analysis:

• Evaluate the cost of energy consumption. • Review the cost of energy bills and utility data. • Analyze the cost of energy consumption and identify potential areas for improvement.	• The cost of energy consumption is provided below, indicating that the organization has paid Rs.6,59,406 from March 2023 to FEB 2024. Reference fig/doc:- Appendix table • The cost of the energy bill and utility data Rs.6,59,406 for 12 months. Reference fig/doc:- Appendix table The analysis of the cost of energy consumption and identification of potential areas for improvement are given in the table below.

To analyze the cost of energy consumption and identify potential areas for improvement, follow these steps:

Gather Energy Bills: Collect energy bills for the past 12-24 months, including electricity, gas, and any other relevant utilities.
Calculate Total Energy Costs: Calculate the total cost of energy consumption for each billing period.
Analyze Cost Trends: Look for trends in energy costs over time. Identify any significant increases or changes in costs.
Compare Costs to Usage: Compare the cost of energy consumption to the actual usage (e.g., kilowatt-hours for electricity) to determine the cost per unit of energy.
Identify High-Cost Areas: Identify areas of the college where energy costs are highest. This could include specific buildings, departments, or types of equipment.
Consider External Factors: Take into account external factors that may influence energy costs, such as changes in utility rates, weather patterns, or operational changes.
Identify Potential Areas for Improvement: Based on the analysis, identify potential areas for improvement, such as upgrading equipment, improving insulation, or implementing energy-saving practices.
Develop Recommendations for Improvement: Develop recommendations for improvement based on the analysis, focusing on strategies that can reduce energy costs.
Implement Energy-Saving Measures: Implement the recommended energy-saving measures, and monitor energy bills to assess the impact of the improvements over time.
Continuous Monitoring and Adjustment: Continuously monitor energy costs and usage patterns to

identify further opportunities for improvement and make adjustments as needed.
By analyzing the cost of energy consumption and identifying potential areas for improvement, the college can develop targeted strategies to reduce energy costs and save money.

Benchmarking:	
• Compare energy consumption and cost to industry benchmarks and best practices. • Identify areas where energy consumption and cost are above industry benchmarks. • Recommend solutions to bring energy consumption and cost in line with industry benchmarks.	• No record found at the time of audit. • No record found at the time of audit • The analysis of the cost of energy consumption and identification of potential areas for improvement are given in the table below.

To bring energy consumption and cost in line with industry benchmarks, consider the following solutions:

Energy Audit: Conduct a comprehensive energy audit to identify areas of high energy consumption and inefficiency.
Efficient Equipment: Replace old, inefficient equipment with energy-efficient models. Look for Energy Star certified products.
Building Envelope Improvements: Improve insulation, seal air leaks, and upgrade windows and doors to reduce heating and cooling loads.
Lighting Upgrades: Replace outdated lighting fixtures with energy-efficient LED lighting. Use occupancy sensors and daylight harvesting to optimize lighting usage.
HVAC System Optimization: Upgrade HVAC systems with energy-efficient units and use programmable thermostats to control temperature settings based on occupancy.
Water Heating Efficiency: Install energy-efficient water heaters and consider using solar water heating systems.
Renewable Energy: Install renewable energy systems such as solar panels or wind turbines to offset energy consumption.
Behavioral Changes: Implement energy-saving practices among building occupants, such as turning off lights and equipment when not in use.
Monitoring and Management: Implement energy management systems to monitor and control energy usage in real-time, allowing for adjustments to be made for optimal efficiency.
Training and Education: Provide training and education for building occupants and maintenance staff on energy-efficient practices.
By implementing these solutions, the college can reduce energy consumption and costs, bringing

them in line with industry benchmarks and promoting sustainability.
Nonconformity :- The organization does not set any bench mark for energy audit.

Financial incentives:	
• Review available financial incentives for energy efficiency improvements. • Identify potential incentives for energy efficiency improvements. • Recommend solutions to take advantage of available financial incentives.	• No written evidence was found during the audit regarding financial incentives for energy efficiency improvement. • No written evidence was found during the audit for energy efficiency improvement. Recommended solutions to take advantage of available financial incentives are provided in the table

To take advantage of available financial incentives for energy efficiency improvements, consider the following solutions:

Government Rebates and Incentives: Research and apply for government rebates, tax credits, and incentives for energy-efficient upgrades. These incentives can help offset the upfront costs of improvements.
Utility Rebate Programs: Check with local utility companies for rebate programs for energy-efficient equipment and upgrades. Many utilities offer incentives for installing high-efficiency HVAC systems, lighting, and insulation.
Energy-Efficiency Financing Programs: Explore energy-efficiency financing programs that offer low-interest loans or other financial assistance for energy-saving projects.
Performance-Based Incentives: Consider performance-based incentives that reward energy savings. These incentives are often offered through energy service companies (ESCOs) or utility demand-side management programs.
Energy Savings Performance Contracts (ESPCs): Enter into ESPCs, which allow the college to implement energy-saving measures with no upfront capital costs. The ESCO guarantees a certain level of energy savings, and payments are made from the savings achieved.
Third-Party Financing: Explore third-party financing options, such as energy service agreements (ESAs), where a third party finances and implements energy-saving measures in exchange for a portion of the energy savings.
Green Building Certification Programs: Pursue green building certification programs, such as LEED or ENERGY STAR, which can qualify the college for additional incentives and recognition.
Energy Efficiency Grants: Look for energy efficiency grants offered by government agencies, non-profit organizations, and foundations to fund energy-saving projects.
Tax Incentives: Take advantage of tax incentives for energy-efficient improvements, such as the Federal Investment Tax Credit (ITC) for solar energy systems.

Consult with Energy Experts: Consult with energy efficiency experts or professionals who can provide guidance on available incentives and the best strategies to maximize savings. By leveraging these financial incentives, the college can reduce the cost of energy efficiency improvements and accelerate the payback period for these investments.
Nonconformity :- 1. Absence of written documentation for reviewing available financial incentives for energy efficiency improvements at the college. 2. Absence of written documentation for identifying potential incentives for energy efficiency improvements at the college**.**

Building automation system

HVAC control:	
• Evaluate the HVAC control system and its programming. • Review the performance of the HVAC control system. • Identify opportunities to optimize HVAC performance and reduce energy consumption.	• Not applicable • Not applicable • Not applicable

Lighting control:	
• Evaluate the lighting control system and its programming. • Review the performance of the lighting control system. • Identify opportunities to optimize lighting performance and reduce energy consumption.	• Not applicable • Not applicable • Not applicable

Energy monitoring:	
• Evaluate the building's energy monitoring systems.	• The building energy monitoring system includes the electricity

• Review the accuracy and effectiveness of energy monitoring systems. • Identify opportunities to improve energy monitoring and identify energy-saving opportunities.	meters, which were found to be satisfactory during the audit. Reference fig/doc:- appendix 1 • The accuracy and effectiveness of the energy monitoring system are satisfactory. • Opportunities to improve energy monitoring and identify energy-saving opportunities are provided below

To improve energy monitoring and identify energy-saving opportunities, consider the following strategies:

Install Energy Management Systems (EMS): Implement EMS to monitor and control energy usage in real-time. EMS can help identify areas of high energy consumption and optimize energy use.
Submetering: Install submeters to monitor energy usage in specific areas or equipment. This allows for more detailed monitoring and targeted energy-saving efforts.
Energy Audits: Conduct regular energy audits to identify areas of inefficiency and prioritize energy-saving opportunities.
Benchmarking: Use energy benchmarking tools to compare energy usage against similar buildings or industry standards. This can help identify areas where energy use is higher than average and target those for improvement.
Remote Monitoring: Use remote monitoring systems to track energy usage and performance of equipment from a central location. This can help identify issues early and optimize energy use.
Data Analysis: Analyze energy data to identify patterns and trends in energy usage. This can help identify opportunities for improvement and optimize energy use.
Energy Reporting: Generate regular energy reports to track energy usage and performance over time. Share these reports with building occupants and stakeholders to raise awareness and encourage energy-saving behaviors.
Occupant Engagement: Engage building occupants in energy-saving efforts by providing feedback on their energy usage and encouraging them to adopt energy-efficient practices.
Continuous Improvement: Continuously monitor energy usage and performance, and implement measures to improve energy efficiency over time.
By implementing these strategies, the college can improve energy monitoring, identify energy-saving opportunities, and reduce energy consumption and costs.

Equipment control:

• Evaluate the building's equipment control systems. • Review the performance of equipment control systems. • Identify opportunities to optimize equipment performance and reduce energy consumption.	• Not applicable • Not applicable • Identify opportunities to optimize equipment performance and reduce energy consumption below

To optimize equipment performance and reduce energy consumption, consider the following opportunities:

Regular Maintenance: Implement a regular maintenance schedule for equipment to ensure it operates efficiently. This includes cleaning, lubricating, and replacing worn parts.
Equipment Upgrades: Consider upgrading older equipment with newer, more energy-efficient models. Look for Energy Star or other energy-efficient certifications.
Equipment Scheduling: Use equipment scheduling to operate equipment only when needed, such as during peak demand periods or when occupancy is high.
Adjustment of Set Points: Adjust temperature and humidity set points to reduce energy consumption while maintaining comfort levels.
Energy-Efficient Settings: Configure equipment to operate in energy-saving modes when not in use or during off-peak hours.
Use of Renewable Energy: Consider integrating renewable energy sources, such as solar or wind power, to reduce reliance on traditional energy sources.
Occupancy Sensors: Install occupancy sensors to control lighting, HVAC, and other equipment based on occupancy levels.
Energy Monitoring: Implement energy monitoring systems to track energy consumption and identify opportunities for improvement.
Employee Training: Provide training for employees on energy-saving practices and the importance of energy efficiency.
Behavioral Changes: Encourage behavioral changes among employees to turn off equipment when not in use and adopt other energy-saving practices.
By implementing these strategies, the college can optimize equipment performance, reduce energy consumption, and lower operating costs.

Optimization Strategies:	
• Evaluate the building's optimization strategies, such as occupancy sensors, demand response, and night setbacks. • Review the effectiveness of optimization strategies.	• Not applicable • Not applicable • Not applicable

• Identify opportunities to optimize optimization strategies and reduce energy consumption.	

To optimize optimization strategies and further reduce energy consumption, consider the following opportunities:

Continuous Monitoring and Analysis: Continuously monitor energy consumption and analyze data to identify additional areas for improvement and optimization.
Advanced Controls and Automation: Implement advanced controls and automation systems to optimize energy use based on real-time data, occupancy, and other factors.
Energy Modeling: Use energy modeling software to simulate different scenarios and identify the most effective energy-saving strategies.
Demand Response Programs: Participate in demand response programs to reduce energy consumption during peak demand periods and take advantage of incentives.
Energy Storage: Implement energy storage systems to store excess energy for use during peak demand periods or when renewable energy sources are not available.
Grid Integration: Integrate with the grid to take advantage of dynamic pricing and optimize energy consumption based on grid conditions.
Employee Engagement: Continue to engage employees in energy-saving efforts and encourage them to suggest ideas for further optimization.
Partnerships and Collaborations: Collaborate with other organizations and experts to share best practices and learn about new technologies and strategies for energy optimization.
Regular Reviews and Updates: Regularly review and update energy management plans to incorporate new technologies and best practices.
Investment in Research and Development: Invest in research and development to explore new technologies and strategies for further energy optimization.
By implementing these strategies, the college can continue to optimize energy consumption and reduce costs while promoting sustainability and environmental responsibility.

Building Design

Orientation and layout:	
• Evaluate the building's orientation and layout. • Review the building's exposure to sunlight and wind. • Identify opportunities to optimize orientation and layout to reduce	• The building orientation and layout map are shown below. It indicates that the college has good exposure to light. Reference fig/doc:- Appendix data - 2

energy consumption.	• The building is exposed to sunlight and wind, and due to the rotation of the sun, light moves to both sides of the rooms. Reference fig/doc:- Appendix data - 2 • Opportunities to optimize orientation and layout to reduce energy consumption are provided in the table below.

To optimize orientation and layout to reduce energy consumption, consider the following opportunities:

Passive Solar Design: Orient buildings to take advantage of natural sunlight for heating and lighting. Use shading devices to prevent overheating in summer.
Building Shape and Layout: Design buildings with efficient shapes and layouts to minimize heat loss or gain and reduce the need for artificial lighting.
Daylighting: Maximize natural daylight by using skylights, light shelves, and reflective surfaces to reduce the need for electric lighting during the day.
Window Placement: Place windows strategically to optimize natural ventilation and reduce the need for mechanical cooling.
Shading Strategies: Use external shading devices such as awnings, louvers, or trees to block direct sunlight and reduce cooling loads.
Landscaping: Use landscaping to provide shade, reduce wind exposure, and improve overall comfort and energy efficiency.
Building Materials: Use high thermal mass materials for better insulation and temperature regulation.
Roof Design: Choose roofing materials with high solar reflectance to reduce heat absorption.
Energy Modeling: Use energy modeling software to analyze different orientations and layouts to determine the most energy-efficient design.
Regular Maintenance: Ensure that shading devices, windows, and other features are properly maintained to maximize their energy-saving potential.
By optimizing orientation and layout, the college can reduce energy consumption, improve comfort, and lower operating costs.

Insulation:	
• Evaluate the building's insulation and weatherization. • Review the building's insulation	• Walls are 9 inches thick and RCC framestructure for proper

materials and installation. • Identify opportunities to optimize insulation and weatherization to reduce energy consumption.	insulation. • The review of building insulation and materials could not be completed due to the lack of written evidence. Opportunities to optimize insulation and weatherization to reduce energy consumption are provided in the table below.

To optimize insulation and weatherization to reduce energy consumption, consider the following opportunities:

Insulation Upgrades: Upgrade insulation in walls, floors, and roofs to reduce heat loss in winter and heat gain in summer. Use insulation with high R-values for maximum efficiency.
Weather-stripping and Caulking: Seal gaps and cracks around windows, doors, and other openings to prevent air leakage and improve insulation.
Window and Door Upgrades: Replace old windows and doors with energy-efficient models that have double or triple glazing and insulated frames.
Roof Insulation: Insulate the roof to reduce heat gain in summer and heat loss in winter. Consider reflective roof coatings to reduce solar heat gain.
Air Sealing: Seal ductwork, plumbing penetrations, and other openings to prevent air leakage and improve energy efficiency.
Attic Ventilation: Ensure proper attic ventilation to prevent moisture buildup and reduce the need for mechanical cooling.
Insulated Window Treatments: Use insulated curtains or shades to reduce heat loss through windows in winter and heat gain in summer.
Exterior Shading: Install awnings, overhangs, or exterior shades to block direct sunlight and reduce cooling loads.
Foundation Insulation: Insulate the foundation to reduce heat loss through the floor and improve overall energy efficiency.
Energy Audit: Conduct an energy audit to identify areas where insulation and weatherization improvements can be made and prioritize upgrades based on cost-effectiveness.
By optimizing insulation and weatherization, the college can reduce energy consumption, improve comfort, and lower heating and cooling costs.

Nonconformity :-

1. Absence of written documentation for evaluating the building's insulation and weatherization at the college.

Glazing:	
• Evaluate the building's glazing, including windows and skylights. • Review the glazing materials and their performance. • Identify opportunities to optimize glazing to reduce energy consumption.	• Windows and skylights are made of glass to ensure proper glazing. • Ensuring proper glazing in buildings, especially in areas with glass skylights, is crucial for optimizing energy efficiency, enhancing indoor comfort, and maintaining safety and durability. • Identify opportunities to optimize glazing to reduce energy consumption are provided in the table below.

To optimize glazing and reduce energy consumption, consider the following opportunities:

Energy-Efficient Windows: Install energy-efficient windows with low-e coatings, multiple glazing layers, and gas fills (argon or krypton) to reduce heat transfer.
Window Orientation: Orient windows to maximize natural daylight and solar heat gain in winter while minimizing heat gain in summer.
Window Shading: Use external shading devices such as awnings, overhangs, or louvers to block direct sunlight and reduce cooling loads.
Window Films: Apply window films to reduce heat gain and glare while maintaining natural light transmission.
Insulated Window Treatments: Use insulated curtains or shades to reduce heat loss through windows in winter and heat gain in summer.
Operable Windows: Install operable windows to allow for natural ventilation and reduce the need for mechanical cooling.
Window Replacement: Consider replacing old, inefficient windows with energy-efficient models to improve overall energy performance.
Glazing Selection: Choose glazing materials with high solar heat gain coefficients (SHGC) and low U-values to maximize energy efficiency.
Window Design: Design windows with appropriate overhangs, sills, and shading devices to optimize energy performance based on orientation and climate.
Energy Modeling: Use energy modeling software to analyze different glazing options and designs to determine the most energy-efficient solution.
By optimizing glazing, the college can reduce energy consumption, improve comfort, and lower heating and cooling costs.

Lighting systems:	
• Evaluate the building's glazing, including windows and skylights. • Review the glazing materials and their performance. • Identify opportunities to optimize glazing to reduce energy consumption.	• Proper orientation and cleaning of windows ensure that buildings receive an adequate amount of natural light. • Window and skylight glass are made of Soda–lime–silicate glass. • Identify opportunities to optimize glazing to reduce energy consumption are provided in the table below.

To optimize glazing and reduce energy consumption in the lighting system, consider the following opportunities:

Daylight Harvesting: Use glazing and skylights to maximize natural day lighting, reducing the need for artificial lighting during daylight hours.
High-Efficiency Lighting Fixtures: Replace old lighting fixtures with high-efficiency LED or fluorescent fixtures to reduce energy consumption.
Lighting Controls: Install lighting controls such as occupancy sensors, timers, and dimmers to adjust lighting levels based on occupancy and natural light levels.
Task Lighting: Use task lighting instead of overhead lighting to provide focused lighting where it is needed, reducing overall energy consumption.
Lighting Layout and Design: Optimize the layout and design of lighting systems to minimize energy waste and provide adequate lighting levels.
Lighting Automation: Use automated lighting systems that adjust lighting levels based on occupancy and time of day to optimize energy use.
Maintenance: Regularly maintain lighting fixtures to ensure they are clean and functioning properly, which can improve energy efficiency.
Energy Audits: Conduct regular energy audits to identify areas where lighting can be optimized for energy efficiency.
Employee Education: Educate building occupants about the importance of turning off lights when not in use and using natural light whenever possible.
By implementing these strategies, the college can optimize glazing and lighting systems to reduce energy consumption and improve overall energy efficiency.

Renewable energy:	
• Evaluate the potential for renewable energy sources, such as solar or wind power. • Review the feasibility and cost-effectiveness of renewable energy options. • Identify opportunities to implement renewable energy solutions to reduce energy consumption and lower carbon emissions.	• The organization use the renewable energy source in form of solar energy, fully operated from November 2023. Total 60 kV solar panels are in operation to generate electricity. At the time of audit total 17040.2 kWh are generated. Reference fig/doc:- Appendix • Energy option is high, and the renewable energy resource is being used, with potential for further improvement. • The opportunities to implement renewable energy solutions to reduce energy consumption and lower carbon emissions are provided in the table below.

To implement renewable energy solutions to reduce energy consumption and lower carbon emissions, consider the following opportunities:

Solar Photovoltaic (PV) Systems: Install solar PV panels on rooftops or unused land to generate electricity from sunlight.
Solar Water Heating Systems: Use solar thermal collectors to heat water for domestic use or space heating.
Wind Turbines: Install small wind turbines to generate electricity from wind energy, especially in areas with high wind speeds.
Biogas Systems: Use organic waste to produce biogas for cooking, heating, or electricity generation.
Hydropower Systems: Install small-scale hydropower systems in rivers or streams to generate electricity.
Geothermal Systems: Use geothermal heat pumps to extract heat from the ground for space heating and cooling.
Energy Storage: Implement energy storage systems, such as batteries, to store excess energy generated from renewable sources for later use.
Microgrids: Develop microgrid systems that combine renewable energy sources with energy storage and smart grid technologies to optimize energy use.
Energy Efficiency Measures: Implement energy efficiency measures to reduce overall energy consumption and maximize the effectiveness of renewable energy systems.

Financial Incentives: Take advantage of government incentives, such as tax credits or rebates, to help offset the cost of implementing renewable energy systems. By implementing these renewable energy solutions, the college can reduce its reliance on fossil fuels, lower energy costs, and reduce its carbon footprint.

Energy-Efficient Equipment

Energy Efficient Equipment:	
• Check the energy efficiency of all the equipment viz: lighting equipment, including bulbs and fixtures, HVAC equipment, including boilers, chillers, and air handlers. water heaters, including boilers and hot water tanks. office equipment, including computers, printers, and copiers, etc. kitchen equipment, including refrigerators, dishwashers, and ovens. laundry equipment, including washers and dryers, any other equipment	No written evidence was found during the audit for the efficiency of the other equipment, but the AC is mentioned to have a 2 and 3-star rating, so we can infer the efficiency of the equipment.. Reference fig/doc:- appendix data

Nonconformity :-

The organization does not use energy efficient equipment.

Renewable Energy Sources

Solar energy:	
• Evaluate the potential for solar energy, including photovoltaic (PV) panels and solar thermal systems. • Review the feasibility and cost-effectiveness of solar energy options. • Identify opportunities to implement solar energy solutions to reduce energy consumption and lower carbon emissions.	• The college uses solar energy for its functioning, including photovoltaic (PV) panels, but does not have a solar thermal system. Reference doc/fig- appendix data • The feasibility and cost-effectiveness of solar energy options are being considered by the organization for future implementation. Opportunities to implement solar energy solutions to reduce energy consumption and lower carbon emissions are given in the table below.

To implement solar energy solutions to reduce energy consumption and lower carbon emissions, consider the following opportunities:

Solar Photovoltaic (PV) Systems: Install solar PV panels on rooftops, carports, or unused land to generate electricity from sunlight.
Solar Water Heating Systems: Use solar thermal collectors to heat water for domestic use, space heating, or swimming pools.
Solar Air Conditioning: Implement solar-powered air conditioning systems that use solar energy to cool buildings.
Solar Lighting: Use solar-powered outdoor lighting for pathways, parking lots, and other outdoor areas.
Solar-Powered Ventilation: Install solar-powered ventilation systems to reduce the need for mechanical cooling.
Solar-Powered Appliances: Use solar-powered appliances, such as solar ovens or solar refrigerators, to reduce electricity consumption.
Net Metering: Take advantage of net metering programs to receive credit for excess electricity generated by solar PV systems that is fed back into the grid.
Solar Lease or Power Purchase Agreements (PPAs): Consider leasing solar PV systems or entering into PPAs with third-party providers to install and maintain solar panels on campus.
Solar Energy Storage: Use battery storage systems to store excess solar energy for use during times when the sun is not shining.
Educational Initiatives: Implement educational initiatives to raise awareness about the benefits of solar energy and encourage adoption among students, faculty, and staff.
By implementing these solar energy solutions, the college can reduce its reliance on fossil fuels, lower energy costs, and reduce its carbon footprint.

Biomass energy:	
• Evaluate the potential for biomass energy, including wood chips, agricultural waste, and other organic materials. • Review the feasibility and cost-effectiveness of biomass energy options. • Identify opportunities to implement biomass energy solutions to reduce energy consumption and lower carbon emissions.	• Not applicable • Not applicable • Opportunities to implement biomass energy solutions to reduce energy consumption and lower carbon emissions are given in the table below.

To implement biomass energy solutions to reduce energy consumption and lower carbon emissions, consider the following opportunities:

Biomass Heating Systems: Install biomass heating systems that burn wood chips, pellets, or agricultural residues to generate heat for buildings or water heating.
Biomass Cogeneration: Implement biomass cogeneration systems that produce both heat and electricity from biomass fuels, increasing overall energy efficiency.
Biogas Production: Use anaerobic digestion to produce biogas from organic waste, which can be used for heating, cooking, or electricity generation.
Biofuels for Transportation: Use biofuels, such as biodiesel or ethanol, for transportation to reduce reliance on fossil fuels.
Combined Heat and Power (CHP): Implement CHP systems that use biomass fuels to generate electricity and capture waste heat for heating or cooling purposes.
Biomass Gasification: Use biomass gasification technologies to convert biomass into a gas that can be used for heating or electricity generation.
Energy Crops: Grow energy crops, such as switchgrass or willow, that can be harvested and used as biomass fuel.
Waste-to-Energy: Convert municipal solid waste or industrial waste into energy through incineration or other waste-to-energy technologies.
Community Biomass Projects: Collaborate with local communities or industries to develop biomass energy projects that benefit both the college and the community.
Carbon Sequestration: Implement carbon sequestration practices in biomass production to offset carbon emissions associated with biomass energy production.
By implementing these biomass energy solutions, the college can reduce its reliance on fossil fuels, lower energy costs, and reduce its carbon footprint.

Water Usage

Plumbing fixtures:	
• Evaluate the efficiency of plumbing fixtures, including faucets, toilets, and showers. • Review the performance of plumbing fixtures and their water consumption. • Identify opportunities to optimize plumbing fixtures and reduce water consumption.	• The efficiency of the plumbing fixtures, including faucets, toilets, and showers, has been assessed and found to be satisfactory. Reference fig/doc:_ Appendix data • The flow rate of the plumbing fixtures and their water consumption is found to be satisfactory, but there is room for improvement. There is an opportunity to optimize

	plumbing fixtures to reduce water consumption is given in the table..

To optimize plumbing fixtures and reduce water consumption, consider the following opportunities:

Low-Flow Fixtures: Install low-flow faucets, showerheads, and toilets to reduce water usage without compromising performance.
Water-Efficient Appliances: Replace old appliances, such as dishwashers and washing machines, with water-efficient models that use less water per cycle.
Gray Water Systems: Implement gray water systems to capture and reuse water from sinks, showers, and washing machines for irrigation or toilet flushing.
Rainwater Harvesting: Install rainwater harvesting systems to collect and store rainwater for non-potable uses, such as irrigation or toilet flushing.
Leak Detection and Repair: Regularly inspect plumbing systems for leaks and repair them promptly to prevent water waste.
Metering and Monitoring: Install water meters and monitoring systems to track water usage and identify opportunities for conservation.
Educational Initiatives: Educate building occupants about water-saving practices, such as turning off faucets while brushing teeth and fixing leaks promptly.
Landscaping Practices: Use drought-tolerant plants and efficient irrigation systems to reduce outdoor water use.
Policy and Regulation Compliance: Ensure compliance with water conservation policies and regulations to minimize water waste.
Water Audits: Conduct water audits to identify areas where water use can be reduced and prioritize conservation efforts.
By implementing these strategies, the college can optimize plumbing fixtures, reduce water consumption, and promote sustainable water management practices.

Irrigation systems:

• Evaluate the efficiency of irrigation systems, including sprinklers and drip systems. • Review the performance of irrigation systems and their water consumption. • Identify opportunities to optimize irrigation systems and reduce water consumption.	• The organization use external sprinklers for irrigation in garden however no written record was found during the audit regarding the efficiency of the irrigation system, including sprinkler and drip systems. • No written evidence was found during the audit for the above question, so this one cannot be removed.

	The opportunities to optimize the irrigation system and reduce water consumption are given below in the table.

To optimize irrigation systems and reduce water consumption, consider the following opportunities:

Smart Irrigation Controllers: Install smart irrigation controllers that adjust watering schedules based on weather conditions, soil moisture levels, and plant needs.
Drip Irrigation: Use drip irrigation systems that deliver water directly to the root zone of plants, reducing evaporation and runoff.
Soil Moisture Sensors: Install soil moisture sensors to monitor moisture levels and prevent overwatering.
Rain Sensors: Use rain sensors to automatically shut off irrigation systems when it is raining, reducing water waste.
Water-Efficient Landscaping: Choose drought-tolerant plants and use mulch to retain soil moisture and reduce the need for irrigation.
Regular Maintenance: Inspect irrigation systems regularly for leaks, clogs, and other issues that can waste water.
Irrigation Audits: Conduct irrigation audits to identify inefficiencies and opportunities for improvement.
Education and Training: Educate groundskeepers and maintenance staff about water-efficient irrigation practices.
Reclaimed Water: Use reclaimed water for irrigation where available to reduce the use of potable water.
Water Budgeting: Develop a water budget based on plant needs and local climate conditions to optimize irrigation scheduling.
By implementing these strategies, the college can optimize irrigation systems, reduce water consumption, and promote sustainable landscaping practices.

Nonconformity :-

1. Absence of written documentation for evaluating the efficiency of irrigation systems, including sprinklers and drip systems, at the college.
2. Absence of written documentation for reviewing the performance of irrigation systems and their water consumption at the college

Water reuse:	
• Evaluate the potential for water reuse, including greywater and rainwater harvesting. • Review the feasibility and cost-	• The potential use of rainwater harvesting involves recharging groundwater and utilizing excess water for plantation. The water monitoring

effectiveness of water reuse options. • Identify opportunities to implement water reuse solutions to reduce water consumption.	system aids the college in improving water distribution, detecting water loss, and identifying leakages to reduce wastage. A team comprising faculty and administrative staff has been appointed by the college to oversee water management.. Referece fig/doc:- appendix data 2 • Assessing the feasibility and cost-effectiveness of water reuse options will aid in water recharge for the organization and in reducing water consumption. The college also uses the water overflow alarms in the tanks to avoid the wastage ofwater. The following opportunities have been identified for implementing water reuse solutions to reduce water consumption.

To implement water reuse solutions and reduce water consumption, consider the following opportunities:

Gray Water Recycling: Install gray water recycling systems to treat and reuse water from sinks, showers, and washing machines for non-potable purposes such as toilet flushing and irrigation.
Rainwater Harvesting: Implement rainwater harvesting systems to collect and store rainwater for non-potable uses such as irrigation, toilet flushing, and cleaning.
On-Site Wastewater Treatment: Use on-site wastewater treatment systems to treat and reuse wastewater for non-potable purposes.
Dual Plumbing Systems: Install dual plumbing systems to separate potable and non-potable water sources, allowing for the use of reclaimed water for non-potable purposes.
Landscape Irrigation: Use reclaimed water for landscape irrigation to reduce the demand for potable water.
Cooling Tower Makeup Water: Use reclaimed water for cooling tower makeup water to reduce the demand for potable water in cooling systems.
Industrial Processes: Use reclaimed water for industrial processes that do not require potable water quality.
Educational Initiatives: Educate building occupants and the community about the benefits of water reuse and how to implement water-saving practices.
Regulatory Compliance: Ensure compliance with regulations and guidelines related to water reuse to maximize the benefits and safety of reclaimed water use.
Monitoring and Maintenance: Regularly monitor and maintain water reuse systems to ensure they are functioning properly and to maximize water savings.

By implementing these strategies, the college can reduce water consumption, lower water bills, and promote sustainable water management practices.

Leak detection:	
• Conduct a leak detection survey to identify potential leaks in the plumbing system. • Review the performance of the plumbing system and identify opportunities to fix leaks and reduce water consumption.	• The college is also upgrading the water supplyand storage system, so to keep eye on better management of water resources. The college is equipped with only PVC pipe line fittings inplace of convectional GI pipe line fittings to avoid rust and the minimize the level of water waste. In the year 2022, a water tank of the capacity of 5000 litres was replaced with a new one due to leakage. • The performance of the plumbing system and identify opportunities to fix leaks and reduce water consumption are given in the table below.

To review the performance of the plumbing system and identify opportunities to fix leaks and reduce water consumption, consider the following steps:

Conduct a Plumbing Audit: Inspect all plumbing fixtures, pipes, and connections for leaks, drips, or other signs of water loss.
Check Water Meters: Monitor water meters regularly to detect any sudden increases in water usage that may indicate a leak.
Install Leak Detection Devices: Use leak detection devices or smart water meters that can alert you to leaks in real-time.
Repair Leaks Promptly: Immediately repair any leaks or drips in faucets, toilets, or pipes to prevent water waste.
Upgrade Plumbing Fixtures: Replace old or inefficient fixtures with water-efficient models, such as low-flow toilets and faucets.
Install Water-Saving Devices: Install water-saving devices, such as aerators and flow restrictors, to reduce water usage without sacrificing performance.
Educate Building Occupants: Educate students, faculty, and staff about the importance of water conservation and how they can help by reporting leaks and using water wisely.
Monitor Water Usage: Track water usage trends over time to identify any anomalies or areas where water consumption can be reduced.

Implement Water Conservation Policies: Establish policies and guidelines for water conservation, such as limiting outdoor watering and using water-efficient landscaping practices.
Regular Maintenance: Schedule regular maintenance for plumbing systems to ensure they are functioning properly and to prevent leaks and other issues.
By implementing these strategies, the college can improve the performance of its plumbing system, reduce water consumption, and lower water bills.

Education and awareness:	
• Develop education and awareness programs to promote water conservation and encourage sustainable water usage. • Identify opportunities to engage occupants and stakeholders in water conservation efforts.	• The NSS unit of the college regularly organizes awareness programs among students, faculty, and staff to emphasize the importance of water conservation and encourage conservation efforts. Additionally, the NSS unit conducts various campaigns for water conservation beyond the campus, utilizing methods such as "Nukkad Natak" (street plays) and cycle rally • The other opportunities for engaging occupants and stakeholders in water conservation efforts are given below:.

To engage occupants and stakeholders in water conservation efforts, consider the following opportunities:

Education and Awareness Campaigns: Launch educational campaigns to raise awareness about the importance of water conservation and provide tips on how to reduce water usage.
Interactive Workshops and Seminars: Conduct workshops and seminars on water conservation topics, such as leak detection and repair, water-efficient landscaping, and water-saving technologies.
Student Involvement: Involve students in water conservation initiatives, such as organizing water-saving competitions, conducting water audits, or implementing water-saving projects on campus.
Employee Training: Provide training for faculty, staff, and maintenance personnel on water-saving practices and the importance of water conservation.
Water-Saving Challenges: Organize water-saving challenges or contests to encourage occupants to reduce their water usage.
Water Conservation Policies: Implement water conservation policies, such as using water-efficient fixtures and appliances, reducing outdoor watering, and fixing leaks promptly.

Feedback and Recognition: Provide feedback to occupants and stakeholders on their water usage and recognize individuals or departments that achieve significant water savings.
Partnerships with Local Communities: Collaborate with local communities or water conservation organizations to promote water conservation efforts and share best practices.
Water Monitoring and Reporting: Implement water monitoring systems to track water usage and provide regular reports to occupants and stakeholders on their water consumption.
Demonstration Projects: Install water-saving technologies or practices as demonstration projects on campus to showcase their effectiveness and encourage adoption.
By engaging occupants and stakeholders in water conservation efforts, the college can create a culture of water conservation and achieve significant reductions in water consumption.

Energy Audits &Assessments

Energy data collection:	
• Collect data on the building's energy consumption, including electricity, natural gas, and other fuels. • Collect data on the building's operational schedules, occupancy levels, and other factors that may impact energy consumption.	• The data collected from the college regarding building energy consumption shows that the electricity consumed by the college is around 82462 units in the 12-month period. • No written document was found during the audit.

Nonconformity :-

Absence of written documentation for collecting data on the building's operational schedules, occupancy levels, and other factors that may impact energy consumption at the college.

Energy Consumption (Total onsumption of last 12 months)					
Building name	Building size (square footage)	Electricity consumption (kWh)	Natural gas consumption (therms)	Fuel oil consumption (gallons)	Solar Energy
Jagran College of Arts, Science	5000	42869.48	228 kg	1580.98	17040.2
Energy Consumption (Average monthly consumption)					
Building	Building	Electricity	Natural gas	Fuel oil	Solar Energy

name	size (square footage)	consumption (kWh)	consumption (therms)	consumption (gallons)	
Jagran College of Arts, Science	5000	3572.46	19 kg	131.75	4902

Metering Information:

Electricity meter number	Natural gas meter number:	Other Source meter number		
X0692117	37000000050494815			

Cost/Billing Information(Data Collection Period March 2023 to march2024

Electricity billing period (month/year)	Electricity provider:	Electricity account number:	Electricity cost (Rs/kWh)
March 2023 to march2024	KESCO	41700286279 (old) 7318900000 (new) applicable fromMarch 24	₹ 8/- average

Total Annual Cost- ₹ 6,59,406/-

Average Monthly Cost- ₹ 54,950.50/-

Energy modeling and simulation:

• Use energy modeling software to simulate the building's energy performance and identify opportunities for energy savings. • Evaluate the performance of various energy-saving measures, such as upgrading HVAC systems, improving insulation, and implementing	• Not Available

renewable energy sources.	

Nonconformity :-

The organization does not conduct energy modeling and simulation.

Cost-benefit analysis:	
• Evaluate the cost-effectiveness of potential energy-saving measures. • Consider the upfront costs of implementation, as well as the long-term savings in energy costs and carbon emissions.	• No written evidence was found during the audit for the calculation of potential energy-saving measures. The table below shows the upfront cost of implementation, as well as the long-term savings in energy costs and carbon emissions through it.

Nonconformity :-

Absence of written documentation for evaluating the cost-effectiveness of potential energy-saving measures at the college.

When considering the upfront costs of implementation for energy and water conservation measures, it's important to also evaluate the long-term savings in energy costs and carbon emissions. Here are some key points to consider:

Initial Investment: Calculate the upfront costs of implementing energy and water conservation measures, including equipment, installation, and any associated expenses.
Energy Savings: Estimate the potential savings in energy costs over the lifetime of the conservation measures. This can include savings from reduced electricity, gas, or water usage.
Carbon Emissions Reduction: Determine the amount of carbon emissions that can be avoided by implementing the conservation measures. This can be calculated based on the reduction in energy consumption and the carbon intensity of the energy sources.
Payback Period: Calculate the payback period for the upfront investment based on the annual energy cost savings. This will help determine how long it will take to recoup the initial investment.
Lifecycle Costs: Consider the lifecycle costs of the conservation measures, including maintenance, repairs, and eventual replacement. This will give a more accurate picture of the total cost over time.
Financial Incentives: Research available financial incentives, such as rebates, tax credits, or grants, that can help offset the upfront costs of implementation.
Environmental Benefits: Consider the environmental benefits of reducing energy consumption and carbon emissions, including improved air quality and reduced greenhouse gas emissions.
Long-Term Savings: Evaluate the long-term savings in energy costs and carbon emissions over the lifetime of the conservation measures. This can help justify the upfront investment based on the long-term benefits.

By considering both the upfront costs and the long-term savings in energy costs and carbon emissions, colleges can make informed decisions about implementing energy and water conservation measures that are both financially and environmentally beneficial.

Energy conservation related certifications / awards

The college did not receive any energy conservation award.

Appendix 1

General Energy Conservation Tips

1. Electricity

1.1. Schedule your operations to maintain a high load factor

1.2. Minimize maximum demand by tripping loads through a demand controller

1.3. Use standby electric generation equipment for on-peak high load periods.

1.4. Correct power factor to at least 0.99 under rated load conditions.

1.5. Set transformer taps to optimum settings.

1.6. Shut off unnecessary computers, printers, and copiers at night.

2. Motors

2.1. Properly size to the load for optimum efficiency.

2.2. (High efficiency motors offer of 4 - 5% higher efficiency than standard motors)

2.3. Check alignment.

2.4. Provide proper ventilation

2.5. (For every 10°C increase in motor operating temperature over recommended peak, the motor life is estimated to be halved)

2.6. Check for under-voltage and over-voltage conditions.

2.7. Balance the three-phase power supply.

2.8. (An Imbalanced voltage can reduce 3 - 5% in motor input power)

2.9. Demand efficiency restoration after motor rewinding.

3. Fans

3.1. Use smooth, well-rounded air inlet cones for fan air intakes.

3.2. Avoid poor flow distribution at the fan inlet.

3.3. Minimize fan inlet and outlet obstructions.

3.4. Clean screens, filters, and fan blades regularly.

3.5. Use aero foil-shaped fan blades.

3.6. Minimize fan speed.

3.7. Use low-slip or flat belts.

3.8. Check belt tension regularly.

3.9. Eliminate variable pitch pulleys.
3.10. Use variable speed drives for large variable fan loads.
3.11. Use energy-efficient motors for continuous or near-continuous operation
3.12. Eliminate leaks in ductwork.
3.13. Minimize bends in ductwork
3.14. Turn fans off when not needed.

4. Pumps
4.1. Operate pumping near best efficiency point.
4.2. Modify pumping to minimize throttling.
4.3. Adapt to wide load variation with variable speed drives or sequenced control of smaller offices.
4.4. Stop running both pumps -- add an auto-start for an on-line spare or add a booster pump in the problem area.
4.5. Use booster pumps for small loads requiring higher pressures.
4.6. Increase fluid temperature differentials to reduce pumping rates.
4.7. Repair seals and packing to minimize water waste.
4.8. Balance the system to minimize flows and reduce pump power requirements.
4.9. Use siphon effect to advantage: don't waste pumping head with a free-fall (gravity) return.

5. HVAC (Heating / Ventilation / Air Conditioning)
5.1. Tune up the HVAC control system.
5.2. Consider installing a building automation system (BAS) or energy management
5.3. system (EMS) or restoring an out-of-service one.
5.4. Balance the system to minimize flows and reduce blower/fan/pump power requirements.
5.5. Eliminate or reduce reheat whenever possible.
5.6. Use appropriate HVAC thermostat setback.
5.7. Use building thermal lag to minimize HVAC equipment operating time.
5.8. In winter during unoccupied periods, allow temperatures to fall as low as possible without freezing water lines or damaging stored materials.
5.9. In summer during unoccupied periods, allow temperatures to rise as high as possible without damaging stored materials.
5.10. Improve control and utilization of outside air.
5.11. Use air-to-air heat exchangers to reduce energy requirements for heating and cooling of outside air.
5.12. Reduce HVAC system operating hours (e.g. -- night, weekend).
5.13. Optimize ventilation.
5.14. Ventilate only when necessary. To allow some areas to be shut down when unoccupied, install dedicated HVAC systems on continuous loads (e.g. - computer rooms).
5.15. Provide dedicated outside air supply to kitchens, cleaning rooms, combustion equipment, etc. to avoid excessive exhausting of conditioned air.

5.16. Use evaporative cooling in dry climates.
5.17. Clean HVAC office coils periodically and comb mashed fins.
5.18. Upgrade filter banks to reduce pressure drop and thus lower fan power requirements.
5.19. Check HVAC filters on a schedule (at least monthly) and clean/change if appropriate.
5.20. Check pneumatic controls air compressors for proper operation, cycling, and maintenance.
5.21. Isolate air-conditioned loading dock areas and cool storage areas using high speed doors or clear PVC strip curtains.
5.22. Install ceiling fans to minimize thermal stratification in high-bay areas.
5.23. Relocate air diffusers to optimum heights in areas with high ceilings.
5.24. Consider reducing ceiling heights.
5.25. Eliminate obstructions in front of radiators, baseboard heaters, etc.
5.26. Check reflectors on infrared heaters for cleanliness and proper beam direction.
5.27. Use professionally-designed industrial ventilation hoods for dust and vapor control.
5.28. Use local infrared heat for personnel rather than heating the entire area.
5.29. Use spot cooling and heating (e.g. -- use ceiling fans for personnel rather than cooling the entire area).
5.30. Purchase only high-efficiency models for HVAC offices.
5.31. Put HVAC window offices on timer control.
5.32. Don't oversize cooling offices. (Oversized offices will "short cycle" which results in poor humidity control.)
5.33. Install multi-fueling capability and run with the cheapest fuel available at the time.
5.34. Consider dedicated make-up air for exhaust hoods. (Why exhaust the air conditioning or heat if you don't need to?)
5.35. Minimize HVAC fan speeds.
5.36. Consider desiccant drying of outside air to reduce cooling requirements I humid climates.
5.37. Seal leaky HVAC ductwork.
5.38. Seal all leaks around coils.
5.39. Repair loose or damaged flexible connections (including those under air handling offices).
5.40. Eliminate simultaneous heating and cooling during seasonal transition periods.
5.41. Zone HVAC air and water systems to minimize energy use.
5.42. Inspect, clean, lubricate, and adjust damper blades and linkages.
5.43. Establish an HVAC efficiency-maintenance program. Start with an energy audit and follow-up, then make an HVAC efficiency-maintenance program a part of your continuous energy management program.
6. Lighting
6.1. Reduce excessive illumination levels to standard levels using switching; decamping, etc. (Know the electrical effects before doing de-lamping.)
6.2. Aggressively control lighting with clock timers, delay timers, photocells, and/or occupancy sensors.
6.3. Install efficient alternatives to incandescent lighting, mercury vapour lighting, etc. Efficiency (lumens/watt) of various technologies range from best to worst

6.4. approximately as follows: low pressure sodium, high-pressure sodium, metal halide, fluorescent, mercury vapour, incandescent.
6.5. Select ballasts and lamps carefully with high power factor and long-term efficiency in mind.
6.6. Upgrade obsolete fluorescent systems to Compact fluorescents and electronic ballasts
6.7. Consider lowering the fixtures to enable using less of them.
6.8. Consider day lighting, sky lights, etc.
6.9. Consider painting the walls a lighter color and using less lighting fixtures o lower wattages.
6.10. Use task lighting and reduce background illumination.
6.11. Re-evaluate exterior lighting strategy, type, and control. Control it aggressively.
6.12. Change exit signs from incandescent to LED.
7. DG sets
7.1. Optimize loading
7.2. Use waste heat to generate steam/hot water /power an absorption chiller or
7.3. preheat process or utility feeds.
7.4. Use jacket and head cooling water for process needs
7.5. Clean air filters regularly
7.6. Insulate exhaust pipes to reduce DG set room temperatures
7.7. Use cheaper heavy fuel oil for capacities more than 1MW
8. Buildings
8.1. Seal exterior cracks / openings / gaps with caulk, gasketing, weather stripping, etc.
8.2. Consider new thermal doors, thermal windows, roofing insulation, etc.
8.3. Install windbreaks near exterior doors.
8.4. Replace single-pane glass with insulating glass.
8.5. Consider covering some window and skylight areas with insulated wall panel inside the building.
8.6. If visibility is not required but light is required, consider replacing exterior windows with insulated glass block.
8.7. Consider tinted glass, reflective glass, coatings, awnings, overhangs, draperies, blinds, and shades for sunlit exterior windows.
8.8. Use landscaping to advantage.
8.9. Add vestibules or revolving doors to primary exterior personnel doors.
8.10. Consider automatic doors, air curtains, strip doors, etc. at high-traffic passages between conditioned and non-conditioned spaces. Use self-closing doors if possible.
8.11. Use intermediate doors in stairways and vertical passages to minimize building stack effect.
8.12. Use dock seals at shipping and receiving doors.
8.13. Bring cleaning personnel in during the working day or as soon after as possible to minimize lighting and HVAC costs.
9. Water & Wastewater
9.1. Recycle water, particularly for uses with less-critical quality requirements.
9.2. Recycle water, especially if sewer costs are based on water consumption.

9.3. Balance closed systems to minimize flows and reduce pump power requirements.
9.4. Eliminate once-through cooling with water.
9.5. Use the least expensive type of water that will satisfy the requirement.
9.6. Fix water leaks.
9.7. Test for underground water leaks. (It's easy to do over a holiday shutdown.)
9.8. Check water overflow pipes for proper operating level.
9.9. Automate blow down to minimize it.
9.10. Provide proper tools for wash down -- especially self-closing nozzles.
9.11. Install efficient irrigation.
9.12. Reduce flows at water sampling stations.
9.13. Eliminate continuous overflow at water tanks.
9.14. Promptly repair leaking toilets and faucets.
9.15. Use water restrictors on faucets, showers, etc.
9.16. Use self-closing type faucets in restrooms.
9.17. Use the lowest possible hot water temperature.
9.18. Do not use a heating system hot water boiler to provide service hot water during the cooling season -- install a smaller, more-efficient system for the cooling season service hot water.
9.19. If water must be heated electrically, consider accumulation in a large insulated storage tank to minimize heating at on-peak electric rates.
9.20. Use multiple, distributed, small water heaters to minimize thermal losses in large piping systems.
9.21. Use freeze protection valves rather than manual bleeding of lines.
9.22. Consider leased and mobile water treatment systems, especially for deionizer water.
9.23. Seal sumps to prevent seepage inward from necessitating extra sump pump operation.
9.24. Install pre-treatment to reduce TOC and BOD surcharges.
9.25. Verify the water meter readings. (You'd be amazed how long a meter reading can be estimated after the meter breaks or the meter pit fills with water!)
9.26. Verify the sewer flows if the sewer bills are based on them

10. Miscellaneous
10.1. Meter any unmetered utilities to know what normal efficient use is. Track down causes of deviations.
10.2. Shut down spare, idling, or unneeded equipment.
10.3. Make sure that all of the utilities to redundant areas are turned off – including utilities like compressed air and cooling water.
10.4. Install automatic control to efficiently coordinate multiple air compressors, chillers, cooling tower cells, boilers, etc.
10.5. Renegotiate utilities contracts to reflect current loads and variations.
10.6. Consider buying utilities from neighbors, particularly to handle peaks.
10.7. Leased space often has low-bid inefficient equipment. Consider upgrades if your lease will continue for several more years.

10.8. Adjust fluid temperatures within acceptable limits to minimize undesirable heat transfer in long pipelines.
10.9. Minimize use of flow bypasses and minimize bypass flow rates.
10.10. Provide restriction orifices in purges (nitrogen, steam, etc.).
10.11. Eliminate unnecessary flow measurement orifices.
10.12. Consider alternatives to high-pressure drops across valves.
10.13. Turn off winter heat tracing that is on in summer.

Appendix 2 data send by college

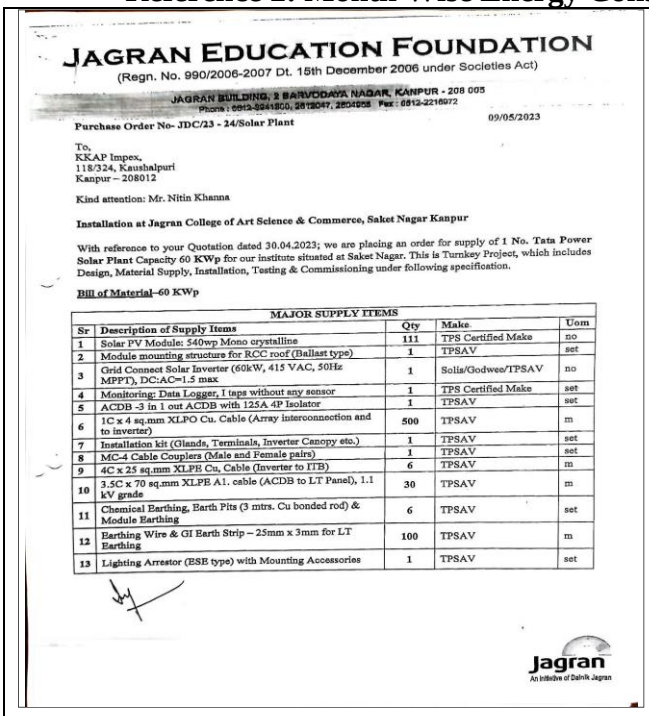
S. No.	Equipment Utility	Rating/Capacity	Quantity
1.	LED BULB/ TUBELIGHTS -9W	9W	176
2.	LED BULB/ TUBELIGHTS -18W	18W	28
3.	LED BULB/ TUBELIGHTS -20W	20W	149
4.	LED BULB/ TUBELIGHTS -40W	40W	290
5.	LED BULB/ TUBELIGHTS -50W	50W	4
6.	LED BULB/ TUBELIGHTS- 100W	100W	9
7.	CFL	12W	6
8.	FAN (Ceiling)	50W	356
9.	FAN (Wall-mounted)	65W	10
10.	Exhaust 75W	75W	12
11.	Exhaust 150W	150W	8
12.	AC (1.5 ton)	3-star	4
13.	AC (2 ton) (Inverter-AC)	3-star	2
14.	AC (2.5 ton)	3-star	15
15.	AC (3 ton)	3-star	2
16.	Refrigerator	3-star	1
17.	Water Cooler	575W/80L	6
18.	Lift	4KW	1
19.	Computers	70W	85
20.	U.P.S.-1	6W	12
21.	U.P.S.- 10 KVA	10 kVA	1
22.	U.P.S.-3 KVA	3 kVA	1
23.	Television	3-star	2
24.	Projector	260W	4
25.	Photocopier/Printer	340W	5
26.	Scanner	11W	2

Reference 1: Utility data of various instruments use in the institution

S.No.	Bill Period	Power Consume (kWh)	Cost (INR)
1.	March 23-April 23	4590.20	64003

2.	April 23-May 23	4823	64468
3.	May 23-June 23	4670.70	55613
4.	June 23-July 23	4839	68437
5.	July 23-August 23	6807.55	96868
6.	August 23-September 23	5838.85	83366
7.	September 23-October 23	5423.95	80626
8.	October 23-November 23	4087.30	60890
9.	November 23-December23	1712 (Two Months of electricity bill come together)	42539
10.	December 23-January 24		
11.	January 24-Febuary 24	58.50	22569
12.	February 24-March 24	18.43	20027

Reference 2: Month Wise Energy Consumption and Cost (Last 12 Months)



JAGRAN EDUCATION FOUNDATION
(Regn. No. 990/2006-2007 Dt. 15th December 2006 under Societies Act)
JAGRAN BUILDING, 2 SARVODAYA NAGAR, KANPUR - 208 005
Phone : 0512-2241800, 2512047, 2504008 Fax : 0512-2216972

Purchase Order No- JDC/23 - 24/Solar Plant 09/05/2023

To,
KKAP Impex,
118/324, Kaushalpuri
Kanpur – 208012

Kind attention: Mr. Nitin Khanna

Installation at Jagran College of Art Science & Commerce, Saket Nagar Kanpur

With reference to your Quotation dated 30.04.2023; we are placing an order for supply of 1 No. Tata Power Solar Plant Capacity 60 KWp for our institute situated at Saket Nagar. This is Turnkey Project, which includes Design, Material Supply, Installation, Testing & Commissioning under following specification.

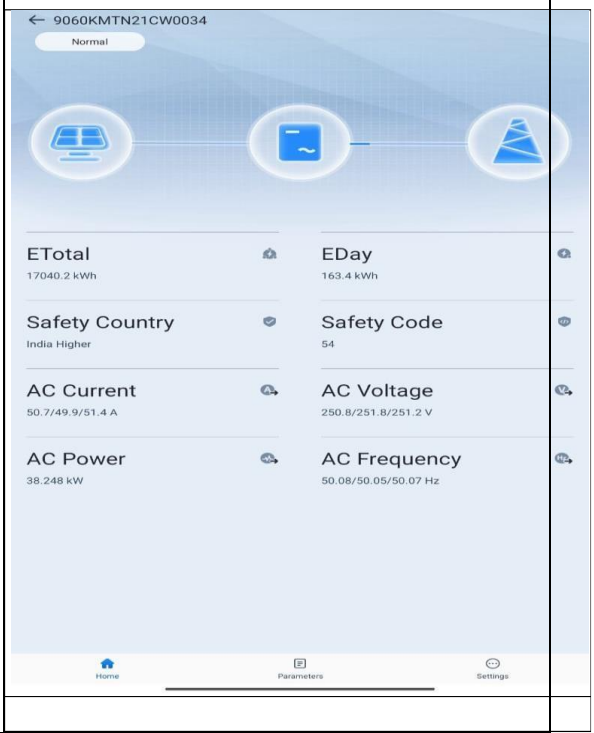
Bill of Material–60 KWp

MAJOR SUPPLY ITEMS

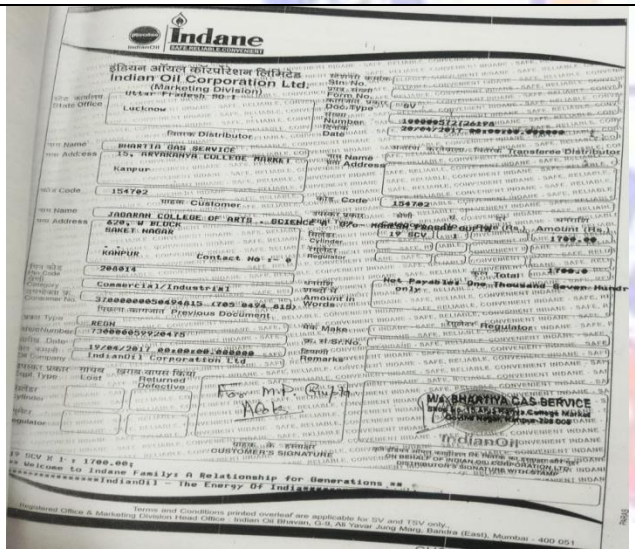
Sr	Description of Supply Items	Qty	Make	Uom
1	Solar PV Module: 540wp Mono crystalline	111	TPS Certified Make	no
2	Module mounting structure for RCC roof (Ballast type)	1	TPSAV	set
3	Grid Connect Solar Inverter (60kW, 415 VAC, 50Hz MPPT), DC:AC=1.5 max	1	Solis/Godwee/TPSAV	no
4	Monitoring: Data Logger, I taps without any sensor	1	TPS Certified Make	set
5	ACDB -3 in 1 out ACDB with 125A 4P Isolator	1	TPSAV	set
6	1C x 4 sq.mm XLPO Cu. Cable (Array interconnection and to inverter)	500	TPSAV	m
7	Installation kit (Glands, Terminals, Inverter Canopy etc.)	1	TPSAV	set
8	MC-4 Cable Couplers (Male and Female pairs)	1	TPSAV	set
9	4C x 25 sq.mm XLPE Cu. Cable (Inverter to ITB)	6	TPSAV	m
10	3.5C x 70 sq.mm XLPE A1. cable (ACDB to LT Panel), 1.1 kV grade	30	TPSAV	m
11	Chemical Earthing, Earth Pits (3 mtrs. Cu bonded rod) & Module Earthing	6	TPSAV	set
12	Earthing Wire & GI Earth Strip – 25mm x 3mm for LT Earthing	100	TPSAV	m
13	Lighting Arrestor (ESE type) with Mounting Accessories	1	TPSAV	set

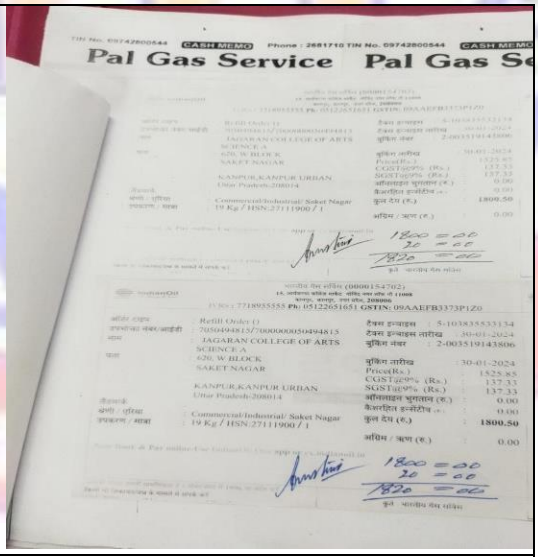
Jagran
An Initiative of Dainik Jagran

Solar installation

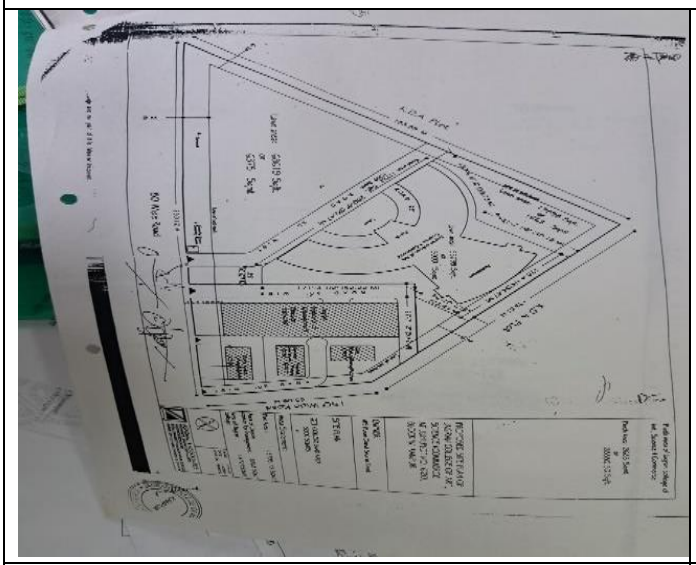


Renewable energy



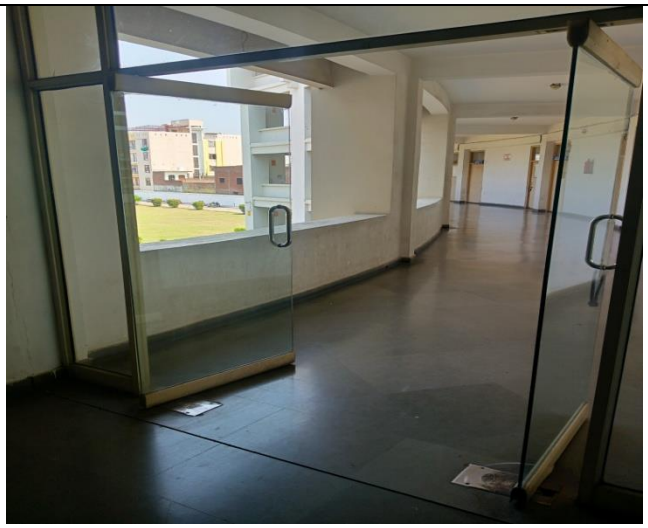


Information of Natural gas Connection and latest usage bill



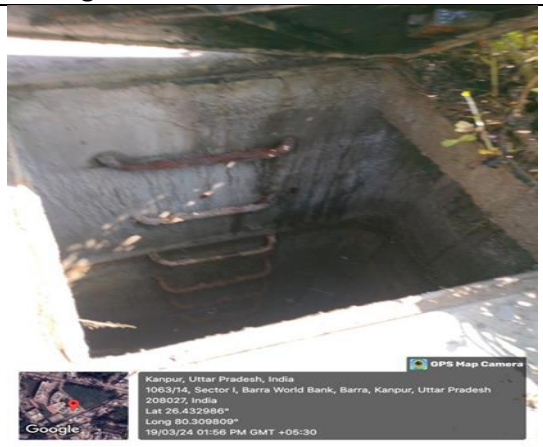
Map of the college

Save Energy awareness poster



Room having natural sunlight

Solar pannel



Rainwater harvesting ground recharge pit

3 star AC

Water tank connection

Ashutosh tiwari

Inspector
CDG Inspection Limited

Certificate of Inspection

Organization	:	Jagran College of Arts, Science & Commerce
Address	:	620,' W' Block, Saket Nagar, Kanpur-208014, U.P India
Inspection Standard	:	Energy Audit
Date of Inspection	:	March 21 & 22, 2024
Inspection Report No.	:	CIL/20242263

CDG Inspection Limited has conducted an energy audit on the campus mentioned above, taking into account the relevant norms and best practices for educational institutions. For details on the audit findings, please refer to the detailed inspection report No. CIL/20242263

Managing Director
CDG INSPECTION LIMITED
W- www.cdginspection.com
E- info@cdginspection.com