QUALITY AUDIT REPORT

ON

WATER AUDIT, ENERGY AUDIT,

WASTE MANAGEMENT AUDIT,

GREEN CAMPUS MANAGEMENT AUDIT

AND ENVIRONMENT AUDIT

OF

GRAPHIC ERA (DEEMED TO BE) UNIVERSITY

BELL ROAD, SOCIETY AREA,

CLEMENT TOWN, DEHRADUN,

UTTARAKHAND – 248002

Graphic Era
Deemed to be
University
DEHRADUN

GRAPHIC ERA
DEEMED TO BE UNIVERSITY

ECO ENERGIME ENGINEERS LLP

ENHANCING RESOURCE EFFICIENCY

QUALITY AUDIT REPORT

OF

GRAPHIC ERA (DEEMED TO BE) UNIVERSITY

BELL ROAD, SOCIETY AREA,

CLEMENT TOWN, DEHRADUN,

UTTARAKHAND – 248002

2024 – 2025



© ECO ENERGIME ENGINEERS LLP

For More Information

Eco Energime Engineers LLP
14, S-1, 3rd Main, 14th Cross
AECS Layout, B – Block
Singasandra
Bangalore–560 068

Mobile: +91 9449 777 000
+91 8050 387 500
Email: info@eeellp.com
Web: www.eeellp.com

PROJECT TEAM

- Mr. A Govindaraj M.Tech., M.S., - EA 5212
- Mr. N.S. Karthikeyan B.E.
- Mr. Akhilesh K Hasbavi B.E.

PROJECT ADVISOR

- Mr. Prabu Das M.Tech
- Ms. Aparna Reddy B.Arch., MBA

ACKNOWLEDGEMENTS

Our special thanks are due to Our Special thanks are due to Principal, Vice-chancellor, Registrar, Office of Dean (Projects) and team of colleagues of **Graphic Era (Deemed to be) University, Dehradun,** for the support, guidance and giving us the opportunity to be involved in this very interesting and challenging assignment.

We would be happy to provide any further clarifications, if required, to facilitate the implementation of the recommendations.

We received full co-operation and support from the concerned personnel/ staff members of the university. They took keen interest and gave valuable inputs during the Quality Audit. We would like to also thank the Registrar and other Staff members who gave their full cooperation and support.

Eco Energime Engineers LLP

NABCB Accredited Type A Inspection Body for
Green Audit | Electrical Safety Audit | Occupational Health and Safety Audit
Bureau of Energy Efficiency Accredited Energy Audit Firm (AEA)

Certificate

This is to certify that M/s. Eco Energime Engineers LLP, Bengaluru has conducted **Quality Audit** of **"Graphic Era (Deemed to be) University Bell Road, Society Area, Clement Town, Dehradun, Uttarakhand"**. The Audit includes water audit, energy audit, waste management audit, green campus management audit and aspects of environment audit.

The audit involves field visit, observations, verification of bills, log books, data base, maintenance registers and interview with staffs, and this gives an overview of the existing system. In an opinion and to the best of our information and according to the information given to us, said Quality Audit gives a true and fair view in conformity with auditing principles.

For Eco Energime Engineers LLP

Authorized Signatory

A Govindaraj – EA 5212
Certified Energy Auditor
Eco Energime Engineers LLP
No. 14, S1, 3rd Main, 14th Cross,
AECS Layout, B-Block, Singasandra
Bengaluru – 560 068, Karnataka

No.14, S-1, 3rd Main, 14th Cross, AECS Layout, B-Block, Singasandra, Bangalore - 560 068, Karnataka
80503 87500 www.eeellp.com info@eeellp.com

Eco Energime Engineers LLP

NABCB Accredited Type A Inspection Body for
Green Audit | Electrical Safety Audit | Occupational Health and Safety Audit
Bureau of Energy Efficiency Accredited Energy Audit Firm (AEA)

EEELLP ACKNOWLEDGEMENT

EEELLP team thanks the management of **"Graphic Era (Deemed to be) University, Bell Road, Society Area, Clement Town, Dehradun, Uttarakhand"** for assigning this interesting work to us. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to Our Special thanks are due to Principal, Vice-chancellor, Registrar, Office of Dean (Projects) and team of colleagues for giving us necessary inputs to carry out this very vital exercise. We would like to thank all the head of the departments and staff members who were actively involved while collecting the data and conducting field measurements.

For Eco Energime Engineers LLP

Authorized Signatory

No.14, S-1, 3rd Main, 14th Cross, AECS Layout, B-Block, Singasandra, Bangalore - 560 068, Karnataka
80503 87500 www.eeellp.com info@eeellp.com

Eco Energime Engineers LLP

NABCB Accredited Type A Inspection Body for
Green Audit | Electrical Safety Audit | Occupational Health and Safety Audit
Bureau of Energy Efficiency Accredited Energy Audit Firm (AEA)

DISCLAIMER

The Audit Team has prepared this report for Graphic Era (Deemed to be) University, Bell Road, Society Area, Clement Town, Dehradun, Uttarakhand, based on the input data submitted by the representatives of University complemented with the best judgment capacity of the expert team.

While all reasonable care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the recommendations are arrived following best judgments and no representation, warranty or undertaking, express or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report

For Eco Energime Engineers LLP

Authorized Signatory

No.14, S-1, 3rd Main, 14th Cross, AECS Layout, B-Block, Singasandra, Bangalore - 560 068, Karnataka
80503 87500 www.eeellp.com info@eeellp.com

Table of Contents

1. Introduction 3

2. Pre – Audit Phase 11

3. On-Site Audit Phase 12

3.1. Scope / Target Areas of Quality Auditing 12

3.1.1. Water Audit 12

3.1.2. Energy Audit 12

3.1.3. Waste Management Audit 12

3.1.4. Green Campus Management Audit 12

3.1.5. Environment Audit 12

3.2. Audit Methodology and Approach 13

3.2.1. Review of Document and Records 13

3.2.2. Review of Policies 14

3.2.3. Review of Various Measures Implemented 19

3.2.4. Site Walkthrough 19

3.2.5. Interviews 21

4. Water Audit 23

4.1. Facility description 23

4.1.1. Raw Water System 27

4.1.2. Drinking Water Purification System 27

4.1.3. Hot Water System 30

4.1.4. Rain Water Harvesting System 32

4.1.5. Sewage Treatment Plant 34

4.2. Best Practices Implemented for Water Conservation 37
4.2.1. Low Flow Taps 37
4.2.2. Awareness Posters on Water Conservation 39
5. Energy Audit 40
5.1. Facility Description 40
5.1.1. Tariff Structure 45
5.1.2. Electricity Consumption Data 45
5.1.3. Solar Roof Top Photo Voltaic (SRTPV) System 47
5.2. Best Practices Implemented for Energy Conservation 49
5.2.1. Day-light Integration 49
5.2.2. Installation of LED lights 50
5.2.3. Installation of Digital LED Display 52
5.2.4. Installation of SRTPV System 53
5.2.5. Installation of Solar Water Heater 55
5.2.6. Installation of Energy Meters 57
5.2.7. Procurement of LED/LCD Monitors 58
5.2.8. Use of Electrical Safety Mats 59
5.2.9. Automatic Rescue Device for Lifts 60
5.2.10. Installation of Streetlights 61
6. Waste Management Audit 63
6.1. Facility Description 63
6.1.1. Types of Waste 63
6.1.2. Dry Waste Management 65
6.1.3. Wet Waste Management 65

6.1.4. Bio-Medical Waste Management 66
6.1.5. Bio-Waste Management 68
6.2. Best Practices Implemented for Waste Management 69
6.2.1. Sewage Treatment Plant 69
6.2.2. Regular Cleaning of Campus 70
6.2.3. Waste Segregation and Storage 71
6.2.4. Awareness Posters on Waste Management 72
7. Green Campus Management Audit 73
7.1. Facility Description 73
7.1.1. Landscaping with Trees and Plants 73
7.1.2. Plantations and Lawn 78
7.2. Best Practices Implemented for Green Campus Management 81
7.2.1. Regular maintenance of Greeneries 82
8. Environment Audit (Carbon Footprint Analysis) 83
8.1. Facility Description 83
8.2. Best Practices Implemented for Environment Conservation 84
8.2.1. Encouraging for Usage of Electric Vehicles 84
8.2.2. Ramp for Physically Challenged Persons 85
8.2.3. Transport Facility for Students 86
8.2.4. Installation of SRTPV System 87
8.2.5. Usage of LED Lights 88
8.2.6. Installation of Solar Water Heater 89
8.2.7. Regular Cleaning of Campus 90
8.2.8. Waste Segregation and Storage 91

8.2.9. Day-light Integration 92
8.2.10. Landscaping with Trees and Plants 93
8.2.11. Restricted Entry of Vehicles 94
8.2.12. Integration of Eco-Friendly Transit Systems 96
9. Annexures 97
9.1. Data Collection Questionnaire 97
9.1.1. General Information of the University 97
9.1.2. Water Audit Details 102
9.1.3. Energy Consumption Details 104
9.1.4. Waste Management Details 107
9.1.5. Green Campus Management Details 109
9.1.6. Carbon Footprint Management Details 110
9.1.7. Photos Required for Audit 110

Table of Figures

Figure 1-1: List of IQAC Members 6

Figure 1-2: Playground 8

Figure 1-3: Sports Facilities Inside Campus and Badminton Court 9

Figure 3-1: Fire Hydrant System Installed in the Buildings 14

Figure 3-2: Fire Extinguisher Near Class Rooms 15

Figure 3-3: Fire Buckets Installed in the campus 16

Figure 3-4: Fire Pump room in the Silver Jubilee Building 17

Figure 3-5: Anti-Ragging Poster 18

Figure 3-6: List of Holidays 21

Figure 4-1: Borewell Pumps 24

Figure 4-2: PVC Water Storage Tanks Installed at the Terrace 25

Figure 4-3: RO Drinking Water System 27

Figure 4-4: Drinking Water Consumption Point 28

Figure 4-5: RO plant – Purchase Bill 29

Figure 4-6: Solar Water Heater Installed at the Terrace of Girl's Hostel 30

Figure 4-7: Hot Water Dispenser Available in Floors 31

Figure 4-8: Rain Water Harvesting System 32

Figure 4-9: Rain Water Borewell Recharging System 33

Figure 4-10: Sewage Treatment Plant (STP) 35

Figure 4-11: Sample Photos of Taps with Aerators 38

Figure 4-12: Awareness Posters on Water Conservation 39

Figure 5-1: Transformer Yard 40

Figure 5-2: Electrical Panel Room 42
Figure 5-3: Diesel Generator (DG) sets 44
Figure 5-4: Diesel Generator (DG) sets Logbook 44
Figure 5-5: Month wise Maximum Demand and Energy Consumption 46
Figure 5-6: Solar Roof Top PV System 47
Figure 5-7: Well-Ventilated and Day-Light Integrated Class Rooms 49
Figure 5-8: LED Lights Installed in Campus 51
Figure 5-9: University Auditorium 51
Figure 5-10: Digital LED Display 52
Figure 5-11: SRTPV Installed at University 53
Figure 5-12: Use of Solar Water Heater 55
Figure 5-13: Energy meter 57
Figure 5-14: Use of LED Monitors in the Computer Labs 58
Figure 5-15: Electrical Safety Mats Near Electrical Panel 59
Figure 5-16: Lift 60
Figure 5-17: Solar LED Street Light 61
Figure 6-1: Wet Waste Bin 65
Figure 6-2: Bio-medical Waste Bin 66
Figure 6-3: Auto Enclave and Certificate of Medical Pollution Control Committee 67
Figure 6-4: SOP of Bio-Medical Waste 67
Figure 6-5: Sanitary Napkin Incinerator at Ground Floor Girls Rest Room in Chanakya Block. 68
Figure 6-6: STP Plant 69
Figure 6-7: Storage of Housekeeping items and logbook 70
Figure 6-8: Colour Coded Dustbins at various disposal points 71

Figure 6-9: Awareness Posters on Waste Management 72
Figure 7-1: Trees in the Campus 75
Figure 7-2: Trees with Name Plates 76
Figure 7-3: Trees near Parking area 77
Figure 7-4: Plantation in the Campus Area 78
Figure 7-5: Plantation Around Main Campus 79
Figure 7-6: List of plants and trees 80
Figure 7-7: Garden Maintenance Activity 82
Figure 8-1: Electric Bug and Charging Point 84
Figure 8-2: Ramp Facility 85
Figure 8-3: Transport Facility for Students 86
Figure 8-4: SRTPV Installed at University 87
Figure 8-5: LED Lights Installed in Campus 88
Figure 8-6: Use of Solar Water Heater 89
Figure 8-7: Storage of Housekeeping items and logbook 90
Figure 8-8: Colour Coded Dustbins 91
Figure 8-9: Well-ventilated and Day-Light Integrated Classroom and Laboratory 92
Figure 8-10: Greeneries in the Campus 93
Figure 8-11: Restricted Entry of Vehicles Poster 94
Figure 8-12: Electric Vehicles for inter campus commute 96

Table of Tables

Table 1-1: Campus Area 7

Table 3-1: Number of Staff and Students 22

Table 4-1: Details of Borewell 23

Table 4-2: Water Consumption and Rain Water Harvesting Capacity 23

Table 4-3: Cost Savings from STP System 36

Table 5-1: Name Plate Details of Transformer 41

Table 5-2: Details of Diesel Generator 44

Table 5-3: Electricity Bill Parameters 45

Table 5-4: Cost Savings from SRTPV System 48

Table 5-5: Cost Savings from SRTPV System 54

Table 5-6: Annual Cost Savings by Installation of Solar Water Heater 56

Table 5-7: Cost Savings from Solar Streetlights 62

Table 6-1: Types of Waste Generated in the University 63

Table 6-2: Type and Quantity of Waste Generated 64

Table 8-1: Details of Eco-Friendly transportation 86

Table 8-2: Maximum and Minium Air Quality Index (AQI) 95

Table 9-1: NAAC Grading's Table 97

Table 9-2: IQAC Members 97

Table 9-3: General Information of the University 98

Table 9-4: Detail Infrastructure of the University 99

Table 9-5: Details of the Departments 100

Table 9-6: Details of the Staff 100

Table 9-7: Details of the Students 101
Table 9-8: Details of the Departments 101
Table 9-9: Water Management Details 103
Table 9-10: Details of STP 103
Table 9-11: Details of RO Plant 104
Table 9-12: Details of Energy Consumption 104
Table 9-13: Details of Solar Energy 105
Table 9-14: Details of Electrical Equipment 106
Table 9-15: Basic Details of Waste Management 107
Table 9-16: Types of Waste Generated 107
Table 9-17: Segregation of Waste 108
Table 9-18: Waste Disposal Methods 108
Table 9-19: List of Plantation Details 109
Table 9-20: List of Plants/Trees in Campus 109
Table 9-21: Details of Carbon Footprint Management 110
Table 9-22: List of Photos 111

ABBREVIATION AND ACRONYMS

1.	A	:	Amperes
2.	AC	:	Air Conditioner
3.	APFC	:	Automatic Power Factor Controller
4.	CCTV Camera	:	Closed Circuit Television Camera
5.	DG	:	Diesel Generators
6.	EE Fan	:	Energy Efficient Fan
7.	E-Waste	:	Electronic Waste
8.	etc.	:	Etcetera
9.	Hz	:	Hertz
10.	HT	:	High Tension
11.	I	:	Current
12.	IQAC	:	Internal Quality Assurance Cell
13.	kgs	:	Kilograms
14.	kL	:	Kilo Litres
15.	kLPD	:	Kilo Litre Per Day
16.	kV	:	Kilo Volt
17.	kVA	:	Kilo Volt Ampere
18.	kVAr	:	Reactive Kilo Volt Ampere
19.	kW	:	Kilo Watt
20.	kWh	:	Kilo Watt hour
21.	kWp	:	Kilo Watt peak
22.	UPCL	:	Uttarakhand Power Cooperation Ltd
23.	Lab	:	Laboratory
24.	LCD	:	Liquid Crystal Display
25.	LED	:	Light Emitting Diode
26.	LT	:	Low Tension
27.	mA	:	Milli Amperes
28.	MoU	:	Memorandum of Understanding
29.	NA	:	Not Applicable
30.	NAAC	:	National Assessment and Accreditation Council
31.	Nos.	:	Numbers
32.	NSS	:	National Service Scheme
33.	Prim/Sec	:	Primary/Secondary
34.	PF	:	Power Factor
35.	PG	:	Post Graduate
36.	Ph.D.	:	Doctor of Philosophy
37.	PV	:	Photo Voltaic
38.	Rs.	:	Rupees
39.	RO	:	Reverse Osmosis
40.	RR. No.	:	Revenue Register Number

41.	S. No.	:	Serial Number
42.	Sq. Ft.	:	Square Feet
43.	Sq.m.	:	Square Meter
44.	SRTPV	:	Solar Roof Top Photo Voltaic
45.	TL	:	Tube Light
46.	TR	:	Ton of Refrigeration
47.	UG	:	Under Graduate
48.	V	:	Volts
49.	W	:	Watts
50.	Wi-Fi	:	Wireless Fidelity
51.	Wp	:	Watt peak
52.	#	:	Number

EXECUTIVE SUMMARY

Conducting Quality Audit covering areas such as water audit, energy audit, waste management audit, green campus management audit and environment audit (carbon foot print perspective only), in University helps to increase the awareness levels of stakeholders, staffs and students, to understand its advantages towards impact on sustainable future.

The Graphic Era (Deemed to be) University Campus is very **well maintained, clean and neat**, which emphasises the resource allocation (manpower, finance and support) by management and importance given for **clean and hygiene environment for students, staffs and stakeholders**.

The environmental awareness initiatives are **substantial**. The installation of solar PV systems, solar hot water systems, STP treated water for gardening purposes, and rain water harvesting system are **noteworthy**. Besides, environmental awareness programmes initiated by the management and administration show how the campus is going green.

As part of Quality Audit of campus, we carried out campus monitoring, including Illumination and Ventilation of the class rooms. It was observed that Illumination and Ventilation are **adequate** considering natural light and fresh air circulation.

From the Quality Audit study, it was observed than the University had taken various initiatives and implemented best practices in conserving natural resources that include:

A. Best Practices Implemented for Water Conservation

- Water consumption monitoring
- RO plant for drinking water
- Sewage Treatment Plant
- Maintenance team

B. Best Practices Implemented for Energy Conservation

- Day light integration in class rooms, staff rooms, hostels and common areas
- Use of LED lights
- Solar Roof Top Photo Voltaic (SRTPV) system for power generation
- Use of Solar water heater for hot water generation
- Complaints and maintenance monitoring registers
- DG sets
- Use of LED/ LCD monitors

- Diesel Consumption & units log book
- Electrical safety practices in electrical room
- LED street lights with timer controls

C. Best Practices Implemented for Waste Management

- STP manure
- Sanitary napkin incinerator
- Waste Segregation
- Sewage Treatment Plant

D. Best Practices Implemented for Green Campus Management

- Green landscaping
- Organic manure for plants
- Regular maintenance of greeneries

E. Best Practices Implemented for Carbon Footprint Analysis

- Solar Roof Top Photo Voltaic (SRTPV) system for power generation
- Usage of LED fixtures
- Use of Solar water heater for hot water generation
- Sewage Treatment Plant
- Daylight integration & ventilation
- Plantations in the campus
- Usage of electric vehicles
- Transport facility for students

Apart from the above the campus has around 3500+ trees and plants, which contributes in absorbing of **106.5 tonnes of CO2 per year**.

Quality Audit will be a valuable tool in the management and monitoring of environmental and sustainable development programs of the University.

1. INTRODUCTION

Graphic Era (Deemed to be University) is the culmination of the hard work of its visionary founder, Prof. (Dr.) Kamal Ghanshala, who had the dream to change the destiny of thousands of youths through quality and holistic education. In 1993, he embarked on the mission to transform the higher education landscape of the Doon Valley with twenty-nine thousand rupees in his pocket and loads of determination and tenacity in his heart, and started off with Graphic Era Computer Centre, developing software and delivering training on Computer Graphics. His vision gained concrete shape in 1997 in the form of Graphic Era Institute of Technology (GEIT).

Nestled in the central part of the scenic and modern city of Dehradun, bordered by Rajaji National Park and the Clement Town Cantonment on either side, the University Campus is a sight to behold. The serene and picturesque campus with the energy of the students studying and staying at the campus is almost infectious and provides an unforgettable experience for all the students who're a part of the Graphic Era fraternity. The Campus is well-equipped with facilities of all kinds, including but not limited to Sports, World Class Accommodation for its students, Gymnasiums, Recreational Areas, State of Art Libraries and Computer Centres, High-Speed Wi-Fi Enabled Campus, State of Art Lecture Theatres equipped with Smart Boards, Auditoriums (Both Indoor and Outdoor), Multiple Cafeterias and Food Trucks and so much more.

In 2008, after successfully establishing itself as a Premier Higher Educational Institution with an outstanding placement record, the Institute was accorded the status of Deemed University under Section 3 of the UGC Act, 1956 vide Notification F.9-48/2007-U.3 (A) dated 14 August 2008 and approved by the Ministry of Human Resource Development, Government of India.

In August 2022, GEU was granted the coveted 'A+' grade by the National Assessment and Accreditation Council (NAAC), after the University had enjoyed NAAC 'A' grade since 2015.

In Dec 2022, GEU became the only university in the region to have 7 NBA accredited programs namely Computer Science & Engineering, Electrical Engineering, Civil Engineering, Electronics & Communication Engineering, Mechanical Engineering, Biotechnology, and Master of Business Administration. The NBA Accreditations bear testimony to the High Standards of Academics at the University and allow students from the University to study at Top Universities across the globe without any hindrances.

In 2022, GEU also launched Online Degree Programs at both UG and PG Levels and achieved the distinction of being the first university in Uttarakhand to offer UGC/AICTE entitled Online education. The University boasts state-of-the-art online content delivery and assessment system to facilitate seamless online learning in these courses, benefitting professionals from the corporate world.

In August 2025, Graphic Era (Deemed to be University) was conferred All-India Rank 48 in the University Category, All-India Rank 52 in the Engineering Category, All-India Rank 52 in the Management Category, and All-India Rank 72 in the Overall Category in the NIRF Ranking. With this, it achieved the distinction of being placed among the top 50 universities in India.

Graphic Era (Deemed to be University) offers more than 85 undergraduate, postgraduate, and doctoral programs with more than 50,000 Alumni and a huge number of High-Quality Faculty from the leading institutions and Universities of the world.

Graphic Era (Deemed to be University) regards industry-academia partnership as an integral part of teaching methodology and curriculum. It has acquired transnational dimensions through student exchange and knowledge-sharing programs with many foreign universities and has been acclaimed and honoured at International forums for its brilliance in upholding the highest standards of education. The University has ensured the inclusion of cutting-edge tech in its curriculum for all engineering programs by getting into partnerships with OEMs from various domains, such as Tata Technologies, TCS, Adobe, Bentley Software, Sapient, and many more, resulting in the creation of next-age engineering professionals.

Graphic Era (Deemed to be University) had realised the potential in the student world and embarked on the mission of facilitating entrepreneurship at a very early stage, and as the Start-Up Sector in India has risen to new heights under the vision of the Government of India, the University already had a robust structure in place to further provide Entrepreneurial Opportunities to its students. A DST Sponsored Technology Business Incubator has been operational in Graphic Era (Deemed to be University) for years and has successfully churned out Ventures of the highest grade that have also been appreciated by the Hon'ble Prime Minister of India, Shri Narendra Modi.

At present, Graphic Era (Deemed to be University) has thousands of full-time students studying on its campus, pursuing education in different disciplines, ranging from engineering, science, business, management, commerce, and hospitality to humanities and social sciences. More than 50,000 Alumni of Graphic Era (Deemed to be University) can be encountered worldwide in marquee brands like Apple, Google, Microsoft, and HSBC, to name a few, and in the service of the nation in all wings of the Armed Forces.

GEU proudly stands among the top 50 universities in India, acclaimed for its commitment to academic excellence and holistic development. The university consistently sets new standards across key parameters, including teaching, learning, research, graduate outcomes, outreach, and industry collaboration. With a strong focus on innovation and quality education, GEU continues to uphold its reputation as a leading institution in higher education.

VALUES

- Faith in God
- Integrity of Character
- Respect for Every Individual
- Pursuit of Excellence
- Commitment to the Country

VISION

We visualize Graphic Era as an internationally recognized, enquiry-driven, ethically engaged diverse community, whose members work collaboratively, for positive transformation in the world, through courageous leadership, in teaching, research, and social action.

MISSION

The mission of the university is to promote learning in the true spirit. The University offers the knowledge and skills needed to succeed as professionals, and the values and sensitivity needed to become responsible citizens of the world. The University will distinguish itself as a diverse, socially responsible learning community of high quality scholarship and academic rigor sustained by an effort that does justice.

IQAC Members

Ref.GEU/R-667/23

April 21, 2023

OFFICE ORDER

This is in continuation of notification no. GEU/R-2703/22 dated September 26, 2022, the Internal Quality Assurance Cell is reconstituted as under :

IQAC Role	Name	Designation
Chair Person	Prof. (Dr.) Narpinder Singh	Vice Chancellor, GEU Deemed to be University
Convener / Director	Prof. (Dr.) Santosh S. Saraf	Director IQAC/ODL
Deputy Director	Prof.(Dr.) Sudhir Joshi	HOD, Department of Aerospace Engg.
Management Representative	Prof. (Dr.) Durgesh Pant	Director General UCOST
Internal Members (Dean/Director/Professor/Associate Prof. /Assistant Prof.)	Prof.(Dr.) P. Krishna	Dean Science
	Prof. (Dr.) Durgaprasad Gangodkar	Dean International Affairs
	Prof. (Dr.) Pravin P. Patil	Joint Director, Ranking & Accreditation
	Prof. (Dr.) Bhaskar Pant	Director Research
	Prof. (Dr.) Pradeep Sharma	Dean, Projects
	Prof. (Dr.) Mahesh Davangeri	Controller of Examination
	Dr. Sachin Ghai	Director TBI
	CA Gaurav Rathore	Finance Officer
	Mr. D. S. Rawat	Senior Administration Officer
	Prof. (Dr.) Rajesh Pokhriyal	Training and Placement Officer
	Prof. (Dr.) D P Singh	HOD, Computer Science Engineering
	Prof. (Dr.) Sanjeev Kumar	HOD, Civil Engineering
	CA Priti Sharma	HOD, Commerce
	Dr. Parvesh Saini	HOD, Electrical Engineering
	Prof. (Dr.) Virendra Bahadur Singh	HOD, Petroleum Engineering
	Prof. (Dr.) Navin Kumar	HOD, Biotechnology
	Prof. (Dr.) Md. Irfanul Hasan	HOD, Electronics & Communication
	Prof. (Dr.) Navneet Rawat	HOD, Management
	Dr. Prabha Lama	HOD, Humanities & Social Science
	Prof. (Dr.) Ashwini Kumar Sharma	HOD, Mechanical Engineering
	Dr. Pankaj Gautam	HOD, Microbiology
	Dr. Anand Chauhan	HOD, Mathematics
	Mr. Amar Dabral	HOD, Hospitality Management
Nominees from local Society, Students and Alumni	Brig. R. P. Nautiyal	Society Representative
	Ms. Sakshi Gupta	Alumni Representative
	Mr. Jai Shankar Bhatt	Student Representative, Dept. of CSE
Nominees from Employers / Industries / Stakeholders	Prof. (Dr.) A.S Shukla	Parent Representative
	Mr. Gaurav Lamba	Head CII, Uttarakhand
IQAC Coordinator	Prof.(Dr.) Rajesh Verma	Department of Mechanical Engineering
IQAC Coordinator	Mr. Rohan	Department of Petroleum Engineering

Registrar

Copy to

PRO. For kind information of the Hon'ble President

1. Vice Chancellor
2. All members of IQAC
3. File

Figure 1-1: List of IQAC Members

Campus Area and Built-up area

The area of the campus (built up and total) is given in Table 1-1.

S. No.	Description	Units	Details
1	Campus total area	Acres	25
2	Built up area	Sq.mts.	84055.27

Table 1-1: Campus Area

Facilities available for physical wellness

The management has provided both indoor and outdoor playgrounds for sports activities. Pictures of the playground and sports complex are shown in Figure 1.2. and 1.3.

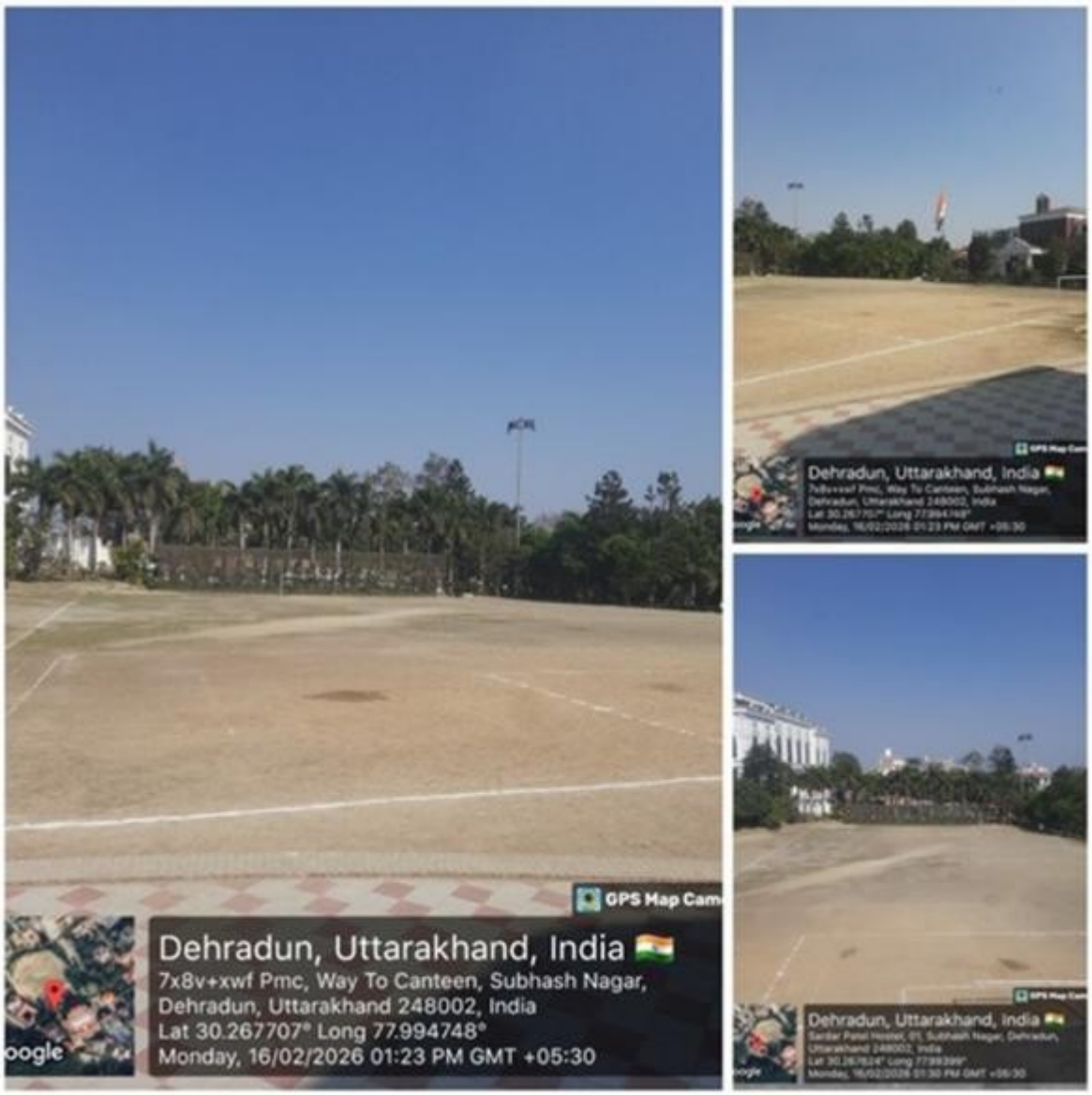


Figure 1-2: Playground

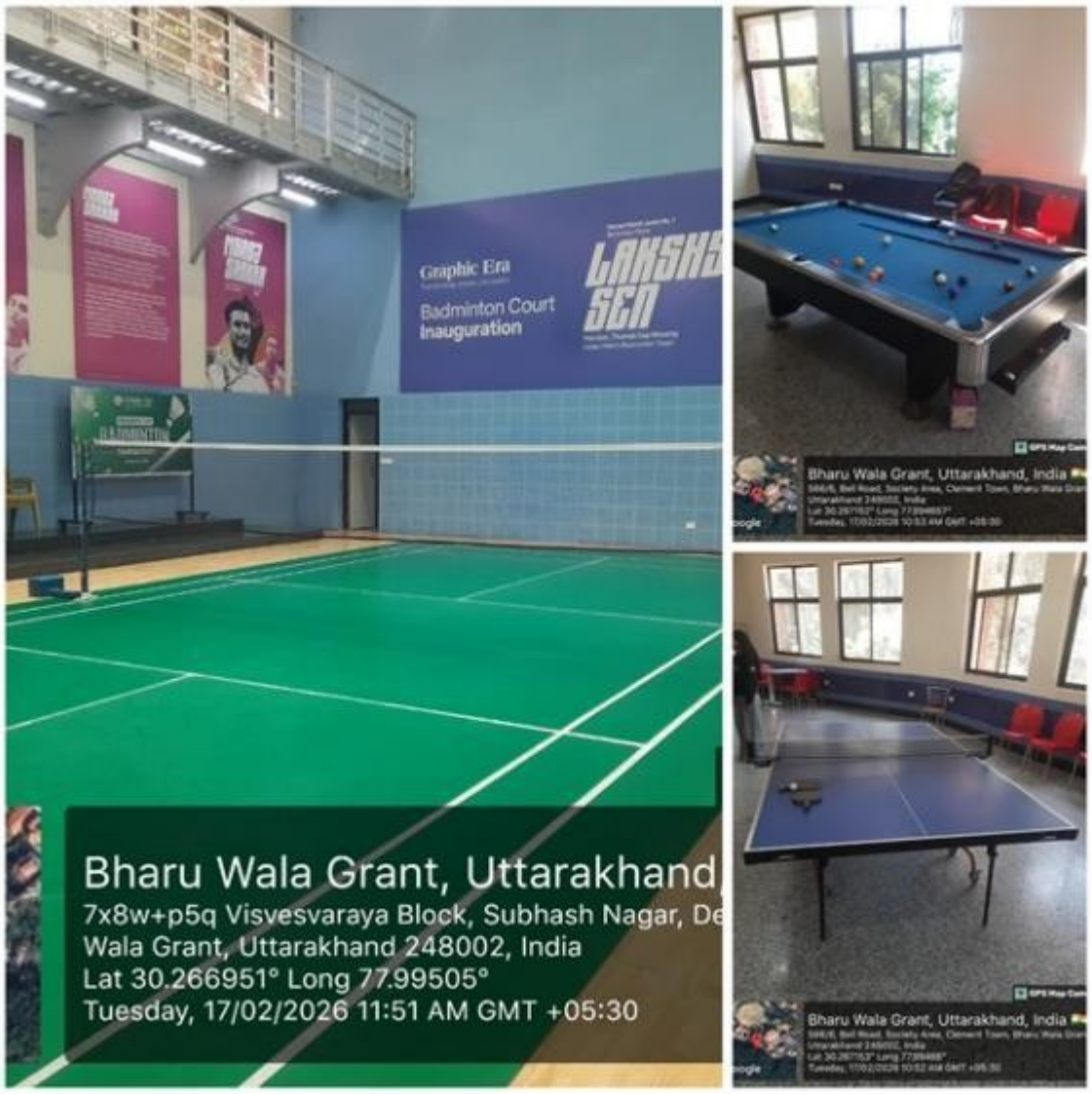


Figure 1-3: Sports Facilities Inside Campus and Badminton Court

Overview of Quality Audit:

Quality Audit helps University to:

- Understand the usage of electricity, water and other natural resources
- Identify opportunities to conserve various natural resources
- Identify various technological improvements
- Evaluate the techno-commercial of identified conservative measures
- Create awareness among the students and staff
- Disseminate the commitment of management towards saving nature
- Develop a culture among students, staff and management to be socially responsible

2. PRE – AUDIT PHASE

A pre-audit meeting is a prerequisite for the Audit; it helps to meet and discuss about the schedule and documents required during the audit. A pre-audit meeting was conducted. During which, introduction of team members, scope and objectives of the audit were discussed.

Management Commitment

The Management of the University has shown significant commitment towards Quality Auditing during the pre-audit meeting. They were ready to encourage all green activities. It is decided to promote all activities that are environment friendly such as awareness programmes on the environment, campus farming, planting more trees on the campus etc., after the Quality Auditing.

University administration is vital to the process of realizing campus sustainability, and University policy is an essential instrument for any substantial change in the campus environment.

Scope and goals of Quality Auditing

A clean and healthy environment aids effective learning and provides a conducive learning environment. There are various efforts around the world to address environmental education issues. Quality Auditing is one among them for educational institutions.

Once a baseline is established, the data can serve as a point of departure for further actions in campus greening. Existing data will allow the University to compare its programs and operations with those of peer institutions, identify areas in need of improvement, and prioritize the implementation of future projects.

This data will also provide a basis for calculating the economic benefits of resource conservation projects by establishing the current rates of resource use and their associated costs. This audit initiative focuses on educating through workshops, guidebooks, fact sheets and ensuring compliance through inspections and self-audits.

3. ON-SITE AUDIT PHASE

3.1. Scope / Target Areas of Quality Auditing

3.1.1. Water Audit

Water Audit addresses water consumption, water sources, appliances and fixtures. Aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.

3.1.2. Energy Audit

Energy Audit addresses energy consumption, energy sources, energy monitoring, lighting, appliances, and vehicles. Energy use is clearly an important aspect of campus sustainability.

3.1.3. Waste Management Audit

Waste Audit addresses waste production and disposal, plastic waste, paper waste, food waste, and recycling. Municipal solid waste has a number of adverse environmental impacts, most of which are well known and not in need of elaboration.

3.1.4. Green Campus Management Audit

Green campus initiatives are becoming an integral part of modern day university systems. Green campus Audit helps in maintaining the air and water clean. It regulates the climatic conditions and provides a healthy and comfortable environment for living.

3.1.5. Environment Audit

Environment Audit addresses the usage of fossil fuels (coal, diesel, petrol and gas). The mode of commute to and from University each day has an impact on the environment through the emission of greenhouse gases into the atmosphere by the burning of fossil fuels.

3.2. Audit Methodology and Approach

The methodology and approach adopted for the study involve various steps that include:

- Review of Document and records
- Review of Policies
- Review of MoUs
- Review of various measures implemented
- Site Walkthrough
- Data Collection
- Interviews

3.2.1. Review of Document and Records

Electricity bills, equipment register, list of appliances, office registers, internal quality audit documents, purchase documents, were reviewed and relevant data and inputs required for analysis have been collected.

3.2.2. Review of Policies

University has various policies that include safety policy, environment policy, and anti-ragging policy.

A. Safety Policy:

An organization's safety policy is a recognized, written statement of its commitment to protect the health and safety of the students and employees, as well as the surrounding community.

All the students, teaching and non-teaching staff, maintenance and house-keeping staff have been given training to use fire extinguishers in emergency situations of fire and explosion. Fire extinguishing cylinders have been installed in each floor and in laboratory areas. Safety policy statements and use of fire extinguisher have been posted at each block. The fire extinguishers, fire hydrant systems, fire buckets and fire pump room are shown in Figures 3-1 to 3-4.

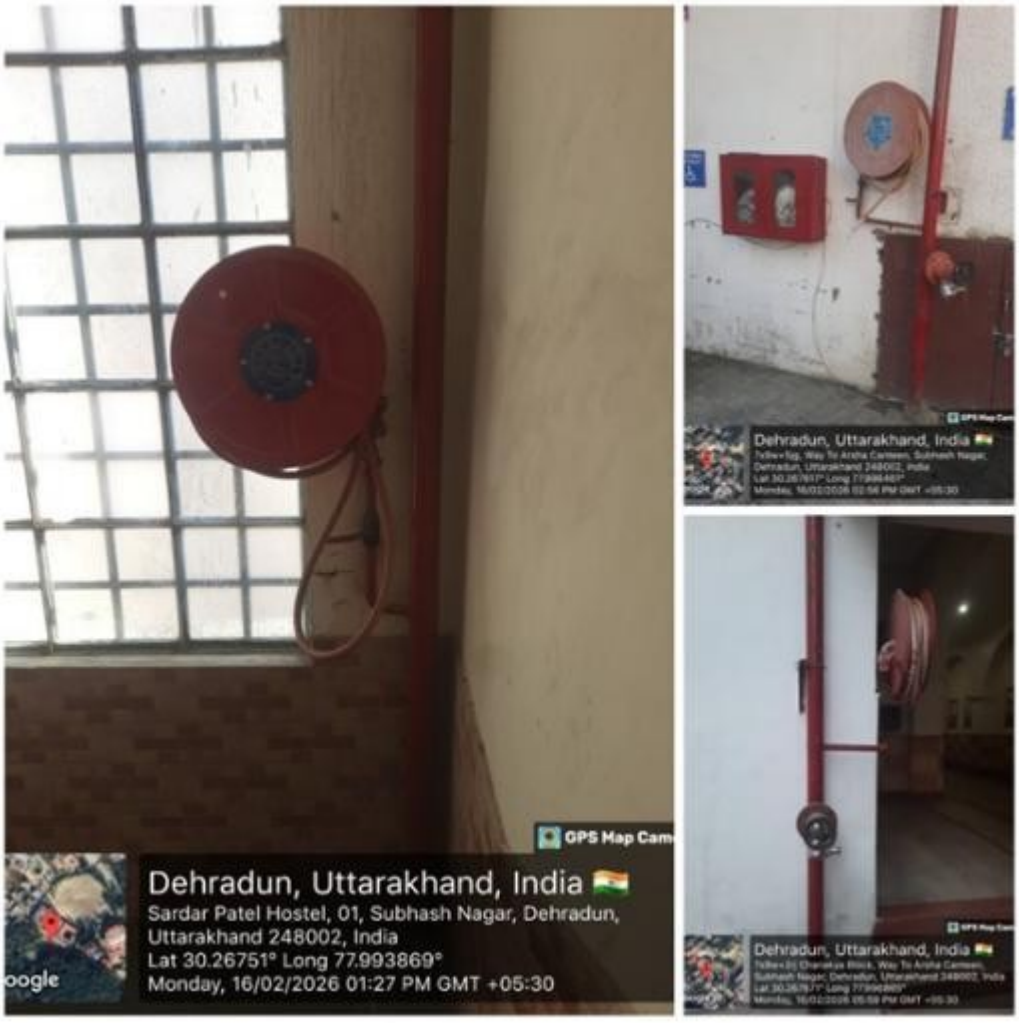


Figure 3-1: Fire Hydrant System Installed in the Buildings

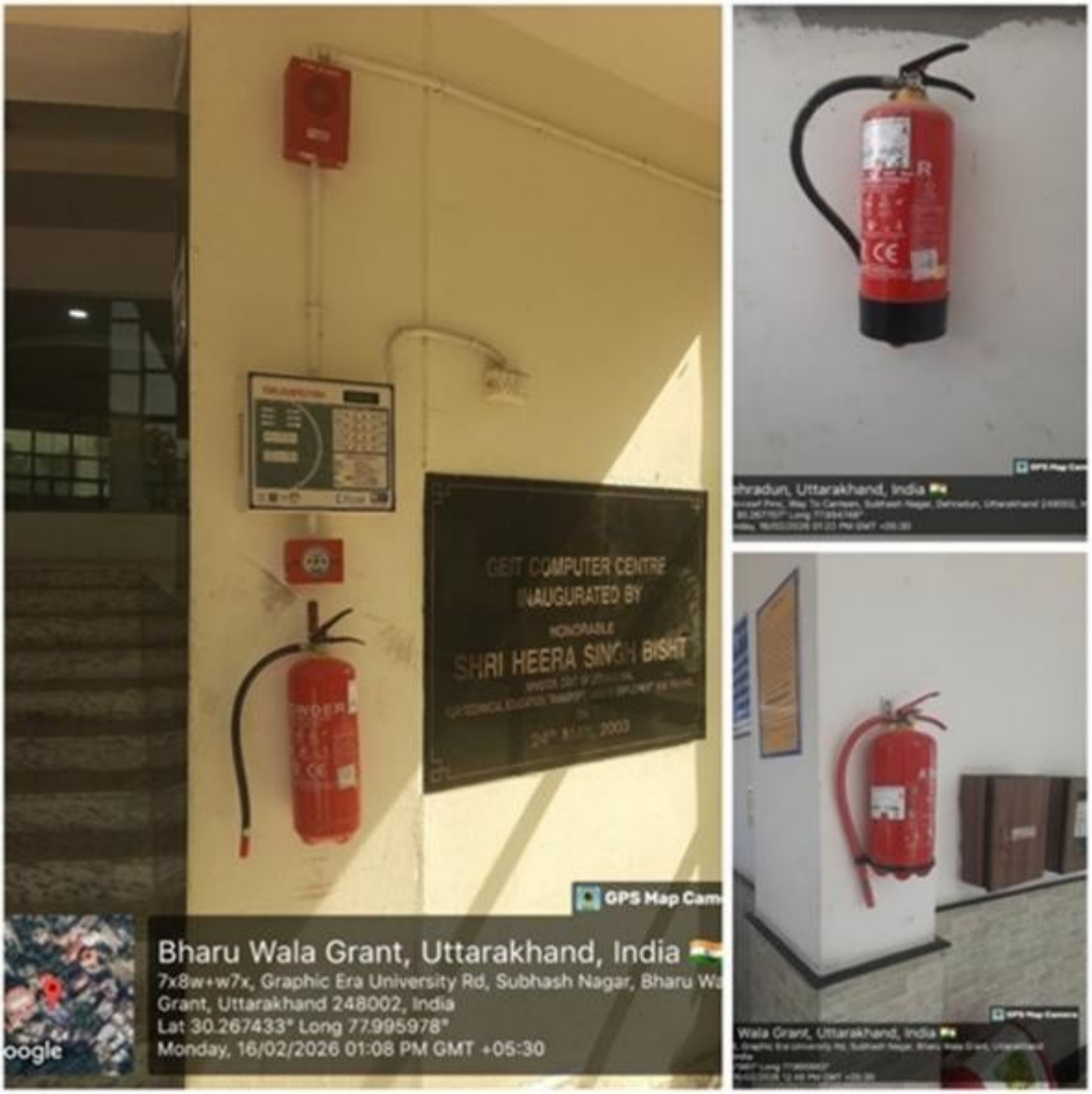


Figure 3-2: Fire Extinguisher Near Class Rooms



Figure 3-3: Fire Buckets Installed in the campus

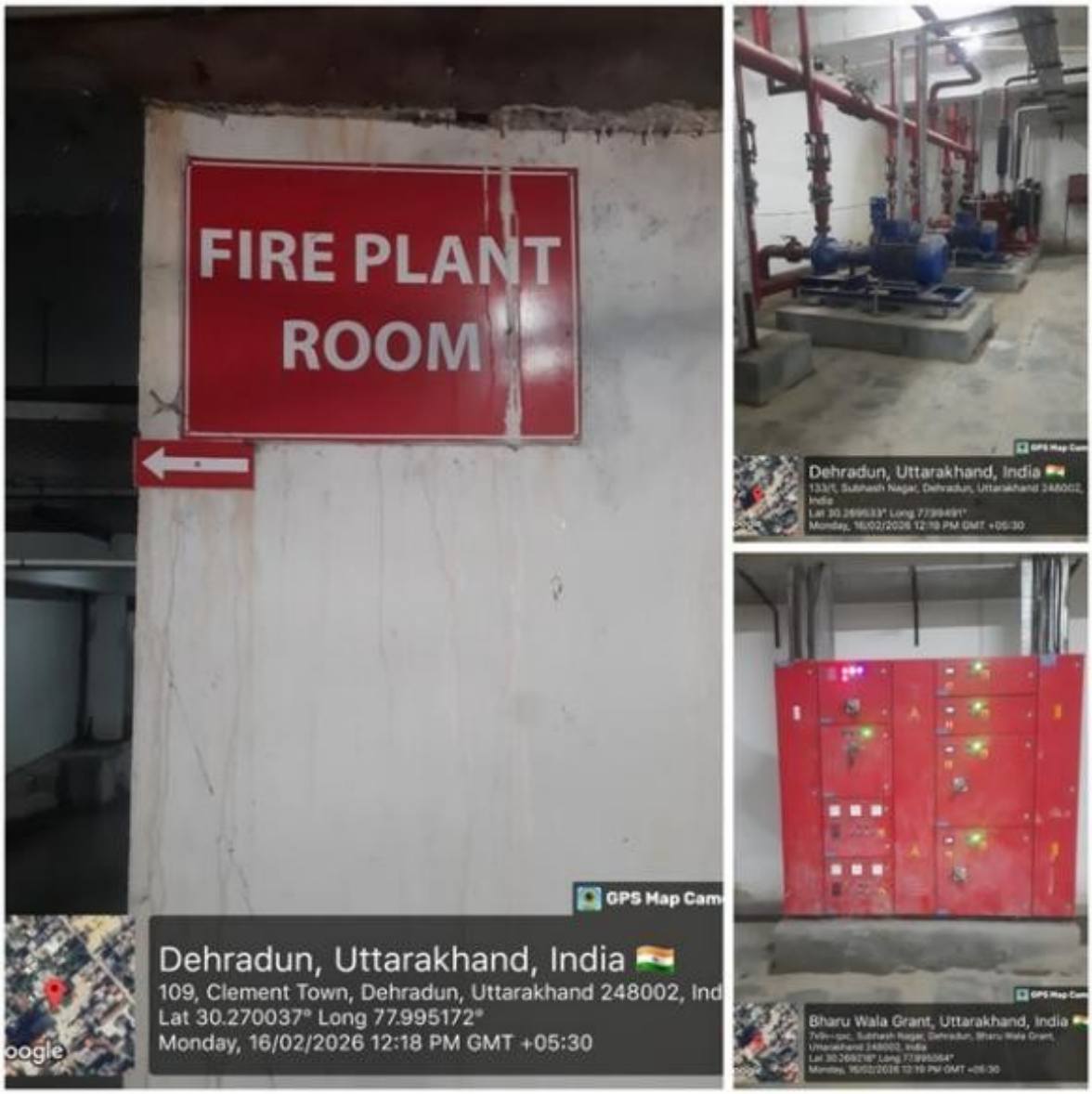


Figure 3-4: Fire Pump room in the Silver Jubilee Building

B. Anti-Ragging

In conformity with Supreme Court judgments and directions, UGC guidelines and State Government Instructions, Graphic Era (Deemed to be) University is following 'Zero-Tolerance Policy' towards ragging. Any student accused and found guilty of ragging, will be severely dealt with, in accordance with the Provisions of the Law.

The sample image of Anti-Ragging poster is shown in Figure 3-5.



Figure 3-5: Anti-Ragging Poster

3.2.3. Review of Various Measures Implemented

During the Quality Audit study, it was observed Graphic Era (Deemed to be) University has taken various initiatives in conserving natural resources that include:

- Quality Audit team including Management, Staff and Students
- Installation of Solar Roof Top Photo Voltaic (SRTPV) system for power generation
- Installation of LED tube lights to reduce electricity consumption
- Installation of waste segregation bins at all the rooms to separate the dry and wet waste
- Installation of LCD/LED monitors for all the desktops to conserve electricity
- Food waste is collected separately and given to organic waste digester.
- Training is conducted on regular basis regarding use of fire extinguisher, conservation of resources such as electricity, water, food and green campus.

3.2.4. Site Walkthrough

Site walkthrough was conducted with staff members, students and audit team members. Staff and students have shown very keen interest in the data collection process and methods to be followed in field data collection. The staff and students have given inputs and suggestions for resource conservation as well.

University Infrastructure

University campus has various blocks and departments. Each floor has state of the art class rooms, staff rooms, laboratories, libraries and many more. Details of infrastructure are as follows:

- ATM Facility
- Gymnasium
- Sports and Games
- Basketball Court
- Football Court
- Cafeterias
- Auditoriums
- Smart Class room
- Seminar Halls
- Conference Rooms
- Meeting Rooms
- RO Water Plant
- Transport

- Stationery & Reprography
- Sewage treatment plant
- Hostel
- 24/7 Security
- Library
- Digital Library
- Staff Rooms
- Walk way for pedestrians
- Tent for rest
- Bank
- Individual Parking for Cars and Two wheelers
- Display board of Biodiversity of campus

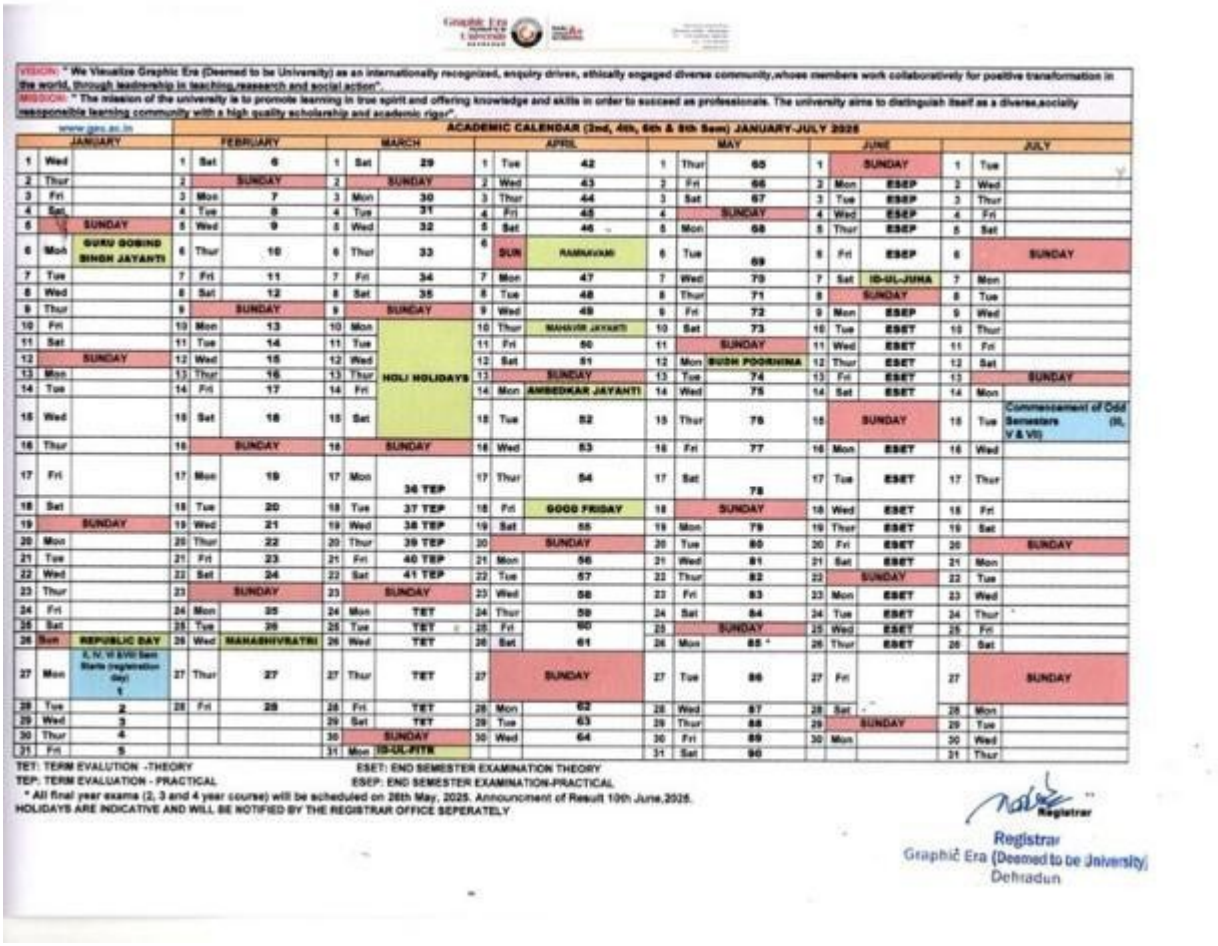
All the classrooms and staff rooms are well ventilated and the integration of day-light is well utilized. This has helped in optimal usage of electricity for lights and fans during day time.

3.2.5. Interviews

To collect the various data, information and operating patterns, interviews were conducted with university staff (Registrar, Principal, teaching staff, non-teaching staff) and students. The consolidated information from the interviews is given in the following sub-sections.

3.2.5.1. List of Holidays:

The list of holidays was collected during the study and the same is given in Figure 3-6.



ACADEMIC CALENDAR (2nd, 4th, 6th & 8th Sem) JANUARY-JULY 2025

JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE			JULY		
1	Wed		1	Sat	6	1	Sat	29	1	Tue	42	1	Thur	65	1	SUNDAY		1	Tue	
2	Thur		2	SUNDAY		2	SUNDAY		2	Wed	43	2	Fri	66	2	Mon	ESEP	2	Wed	
3	Fri		3	Mon	7	3	Mon	30	3	Thur	44	3	Sat	67	3	Tue	ESEP	3	Thur	
4	Sat		4	Tue	8	4	Tue	31	4	Fri	45	4	SUNDAY		4	Wed	ESEP	4	Fri	
5	SUNDAY		5	Wed	9	5	Wed	32	5	Sat	46	5	Mon	68	5	Thur	ESEP	5	Sat	
6	Mon	GURU GOBIND SINGH JAYANTI	6	Thur	10	6	Thur	33	6	SUN	RAMNAVAMI	6	Tue	69	6	Fri	ESEP	6	SUNDAY	
7	Tue		7	Fri	11	7	Fri	34	7	Mon	47	7	Wed	70	7	Sat	ID-UL-JUHA	7	Mon	
8	Wed		8	Sat	12	8	Sat	35	8	Tue	48	8	Thur	71	8	SUNDAY		8	Tue	
9	Thur		9	SUNDAY		9	SUNDAY		9	Wed	49	9	Fri	72	9	Mon	ESEP	9	Wed	
10	Fri		10	Mon	13	10	Mon		10	Thur	MAHAVIR JAYANTI	10	Sat	73	10	Tue	ESET	10	Thur	
11	Sat		11	Tue	14	11	Tue		11	Fri	50	11	SUNDAY		11	Wed	ESET	11	Fri	
12	SUNDAY		12	Wed	15	12	Wed		12	Sat	51	12	Mon	BUDH POORNIMA	12	Thur	ESET	12	Sat	
13	Mon		13	Thur	16	13	Thur	HOLI HOLIDAYS	13	SUNDAY		13	Tue	74	13	Fri	ESET	13	SUNDAY	
14	Tue		14	Fri	17	14	Fri		14	Mon	AMBEDKAR JAYANTI	14	Wed	75	14	Sat	ESET	14	Mon	
15	Wed		15	Sat	18	15	Sat		15	Tue	52	15	Thur	76	15	SUNDAY		15	Tue	Commencement of Odd Semesters (III, V & VII)
16	Thur		16	SUNDAY		16	SUNDAY		16	Wed	53	16	Fri	77	16	Mon	ESET	16	Wed	
17	Fri		17	Mon	19	17	Mon	36 TEP	17	Thur	54	17	Sat	78	17	Tue	ESET	17	Thur	
18	Sat		18	Tue	20	18	Tue	37 TEP	18	Fri	GOOD FRIDAY	18	SUNDAY		18	Wed	ESET	18	Fri	
19	SUNDAY		19	Wed	21	19	Wed	38 TEP	19	Sat	55	19	Mon	79	19	Thur	ESET	19	Sat	
20	Mon		20	Thur	22	20	Thur	39 TEP	20	SUNDAY		20	Tue	80	20	Fri	ESET	20	SUNDAY	
21	Tue		21	Fri	23	21	Fri	40 TEP	21	Mon	56	21	Wed	81	21	Sat	ESET	21	Mon	
22	Wed		22	Sat	24	22	Sat	41 TEP	22	Tue	57	22	Thur	82	22	SUNDAY		22	Tue	
23	Thur		23	SUNDAY		23	SUNDAY		23	Wed	58	23	Fri	83	23	Mon	ESET	23	Wed	
24	Fri		24	Mon	25	24	Mon	TET	24	Thur	59	24	Sat	84	24	Tue	ESET	24	Thur	
25	Sat		25	Tue	26	25	Tue	TET	25	Fri	60	25	SUNDAY		25	Wed	ESET	25	Fri	
26	Sun	REPUBLIC DAY	26	Wed	MAHASHIVRATRI	26	Wed	TET	26	Sat	61	26	Mon	85 *	26	Thur	ESET	26	Sat	
27	Mon	II, IV, VI SVII Sem Starts (registration day) 1	27	Thur	27	27	Thur	TET	27	SUNDAY		27	Tue	86	27	Fri		27	SUNDAY	
28	Tue	2	28	Fri	28	28	Fri	TET	28	Mon	62	28	Wed	87	28	Sat		28	Mon	
29	Wed	3				29	Sat	TET	29	Tue	63	29	Thur	88	29	SUNDAY		29	Tue	
30	Thur	4				30	SUNDAY		30	Wed	64	30	Fri	89	30	Mon		30	Wed	
31	Fri	5				31	Mon	ID-UL-FITR				31	Sat	90				31	Thur	

TET: TERM EVALUTION -THEORY
TEP: TERM EVALUATION - PRACTICAL
ESET: END SEMESTER EXAMINATION THEORY
ESEP: END SEMESTER EXAMINATION-PRACTICAL
* All final year exams (2, 3 and 4 year course) will be scheduled on 26th May, 2025. Announcement of Result 10th June,2025.
HOLIDAYS ARE INDICATIVE AND WILL BE NOTIFIED BY THE REGISTRAR OFFICE SEPERATELY

Registrar
Graphic Era (Deemed to be University)
Dehradun

Figure 3-6: List of Holidays

3.2.5.2. Staff and Students of University:

The number of staff includes teaching, non-teaching, and house-keeping is given in the Table 3-1. The number of students includes both boys and girls.

S. No.	Staff	Students
1	1247	13727

Table 3-1: Number of Staff and Students

4. WATER AUDIT

4.1. Facility description

The water audit study involved carrying out various observations and analysis, to realistically assess usage of water and potential for water conservation.

Borewells are the main source of water, for facilitating the water supply requirement of the entire campus.

12 numbers of borewells are available. The location of the bore wells is given in Table 4-1.

Location	Borewell Numbers
CS-IT Block	1
Chandra Shekhar Azad hostel	2
Sardar Patel Hostel	3
Civil Block	4 & 5
Old MCA Block	6
Main ground	7
Priyadarshini hostel	8
Sarojini hostel	9
Auditorium	10
Gaushala	11 & 12

Table 4-1: Details of Borewell

Details of the Rain Water Harvesting, Total Water Consumed are given in the Table 4-2.

Description	Units (in litre)
Capacity of Rain Water Harvesting	10000
Total Water Consumption	264291120

Table 4-2: Water Consumption and Rain Water Harvesting Capacity

Note: This data was shared by University Personnel

The images of borewells are shown in Figure 4-1.



Figure 4-1: Borewell Pumps

The image of the overhead tanks is shown in Figure 4-2.

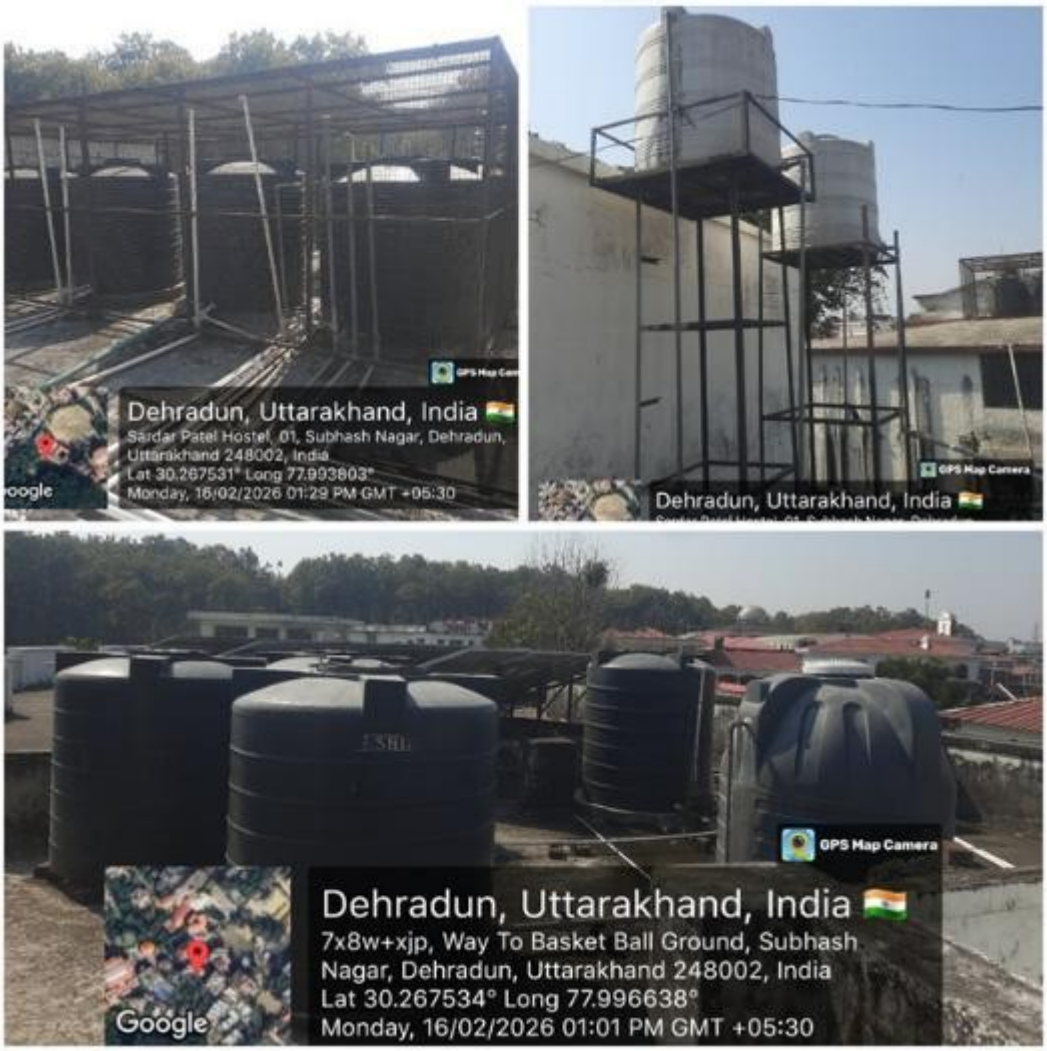


Figure 4-2: PVC Water Storage Tanks Installed at the Terrace

Based on the source, usage, type and recycling, water is classified as following types in the University campus that include:

- Raw Water
- Drinking Water
- Hot Water
- Rain Water
- Sewage Water

Details of the various types of water usages are discussed in detail, in the following sections.

4.1.1. Raw Water System

Raw water is consumed in the following areas:

- RO Input
- Hostel – Bathrooms
- Washrooms
- House Keeping
- Laboratories
- Garden
- Kitchen

4.1.2. Drinking Water Purification System

The drinking water requirements of the entire campus is met by RO water system installed in the institute building. The input water for RO water system is given from overhead tank. The RO water system installed at a terrace is shown in Figure 4-3



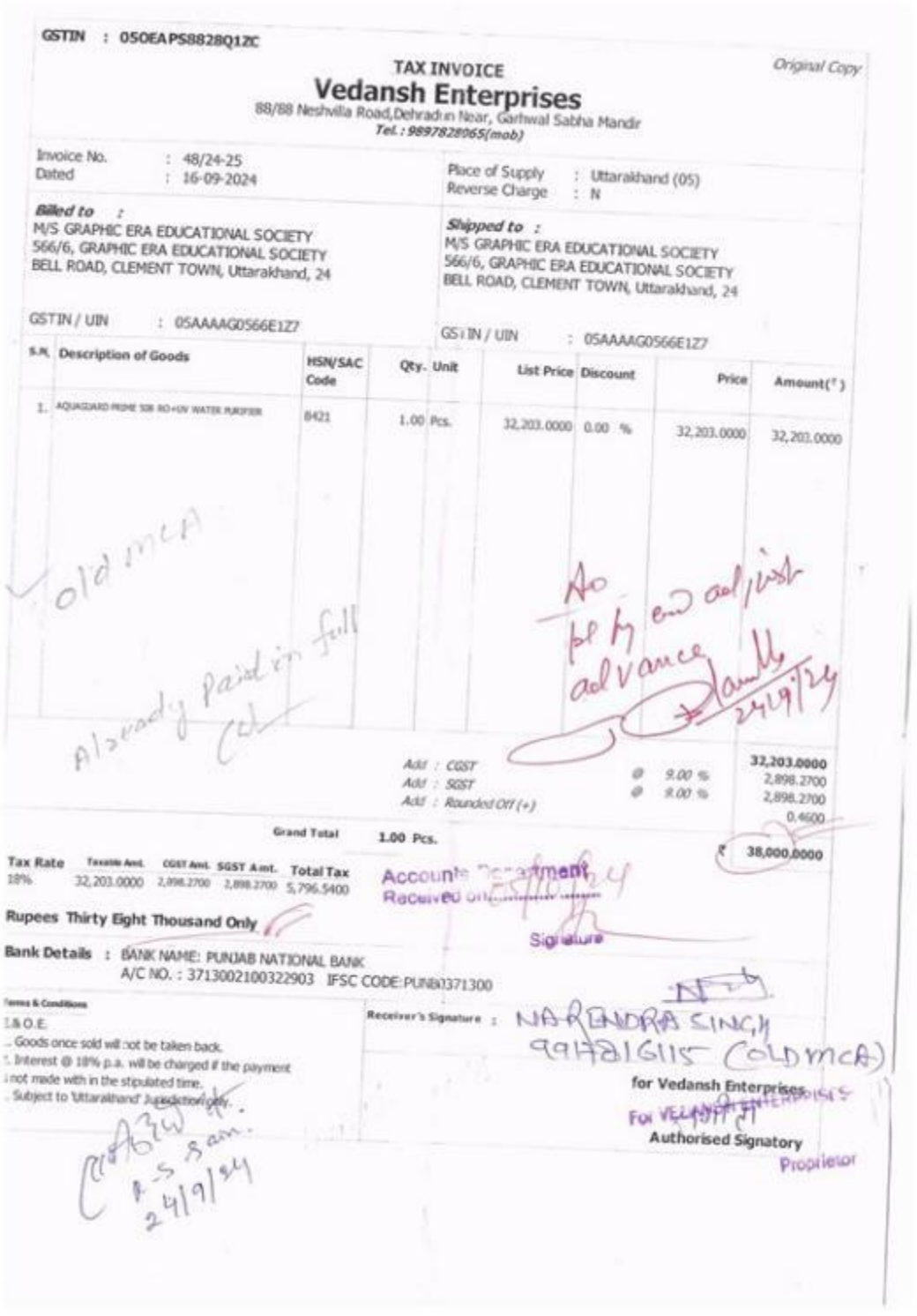
Figure 4-3: RO Drinking Water System

A typical drinking water consumption point at campus is shown in Figure 4-4.



Figure 4-4: Drinking Water Consumption Point

The sample purchase bill of RO plant is shown in Figure 4-5.



GSTIN : 05OEAPS8828Q1ZC

TAX INVOICE

Original Copy

Vedansh Enterprises

88/88 Neshvilla Road,Dehradun Near, Garhwal Sabha Mandir

Tel : 9897828965(mob)

Invoice No. : 48/24-25
Dated : 16-09-2024

Place of Supply : Uttarakhand (05)
Reverse Charge : N

Billed to :
M/S GRAPHIC ERA EDUCATIONAL SOCIETY
566/6, GRAPHIC ERA EDUCATIONAL SOCIETY
BELL ROAD, CLEMENT TOWN, Uttarakhand, 24

GSTIN / UIN : 05AAAAG0566E1Z7

Shipped to :
M/S GRAPHIC ERA EDUCATIONAL SOCIETY
566/6, GRAPHIC ERA EDUCATIONAL SOCIETY
BELL ROAD, CLEMENT TOWN, Uttarakhand, 24

GSTIN / UIN : 05AAAAG0566E1Z7

S.N.	Description of Goods	HSN/SAC Code	Qty.	Unit	List Price	Discount	Price	Amount(₹)
1.	AQUAGUARD PRIME 10R RO+UV WATER PURIFIER	8421	1.00	Pcs.	32,203.0000	0.00 %	32,203.0000	32,203.0000

Cold mca

Already paid in full

As per end adjust advance

24/9/24

Add : CGST	@ 9.00 %		32,203.0000
Add : SGST	@ 9.00 %		2,898.2700
Add : Rounded Off (+)			2,898.2700
			0.4600
Grand Total	1.00 Pcs.		₹ 38,000.0000

Tax Rate	Taxable Amt.	CGST Amt.	SGST Amt.	Total Tax
18%	32,203.0000	2,898.2700	2,898.2700	5,796.5400

Accounts Department

Received on 25/9/24

Signature

Rupees Thirty Eight Thousand Only

Bank Details : BANK NAME: PUNJAB NATIONAL BANK
A/C NO. : 3713002100322903 IFSC CODE:PUNB0371300

Terms & Conditions
E.& O.E.
1. Goods once sold will not be taken back.
2. Interest @ 18% p.a. will be charged if the payment is not made with in the stipulated time.
3. Subject to 'Uttarakhand' Jurisdiction only.

Receiver's Signature : NARENDRA SINGH 9917816115 (COLD MCA)

for Vedansh Enterprises

For VEDANSH ENTERPRISES

Authorised Signatory

Proprietor

24/9/24

Figure 4-5: RO plant – Purchase Bill

4.1.3. Hot Water System

The hot water is mainly consumed in hostels for bathing purposes. The hot water requirement for bathing is met by solar water heater system installed in the girls hostel terraces.

The picture of a solar water heater installed in the hostel is shown in Figure 4-6.



Figure 4-6: Solar Water Heater Installed at the Terrace of Girl's Hostel

RO water is available in all floors to provide drinking water. The RO water is capable of providing normal, hot and chilled water.

Drinking water facilities are available at various locations in the campus



Figure 4-7: Hot Water Dispenser Available in Floors

4.1.4. Rain Water Harvesting System

The rain water from building terraces percolates into the ground through drain system after falling directly into the borewell for recharging. 10000 litres capacity of Rain Water Harvesting is available in the campus.

The image of rain water harvesting and bore well recharge is shown in Figure 4-8.



Figure 4-8: Rain Water Harvesting System

The image of borewell recharge is shown in Figure 4-9.



Figure 4-9: Rain Water Borewell Recharging System

4.1.5. Sewage Treatment Plant

- The sources of waste water in the University campus from all blocks are as follows:
    - Washrooms
    - Toilets
    - Kitchen
    - Hostel
    - Labs
    - Canteen

- Waste water from some of the above mentioned sources are collected and treated at Sewage Treatment Plant (STP). The capacity of STP is 100 kLPD (kilo Litres Per Day).
- The STP treated water goes to Pond. Pond water is treated in Water Treatment Plant (WTP), having capacity of 20 cubic meter per hour of treated water.
- The plumbing system (waste water collection, waste water transfer to WTP, WTP treated water storage and WTP treated water to land scaping and to all hostels) is very well designed, the pipes are laid underground, and access / chambers are provided to regulate and control the flow of water.
- The treated water from the WTP is distributed via underground pipes to the entire campus for gardening and flushing purposes.

The image of Sewage Treatment Plant (STP) is shown in Figure 4-10.

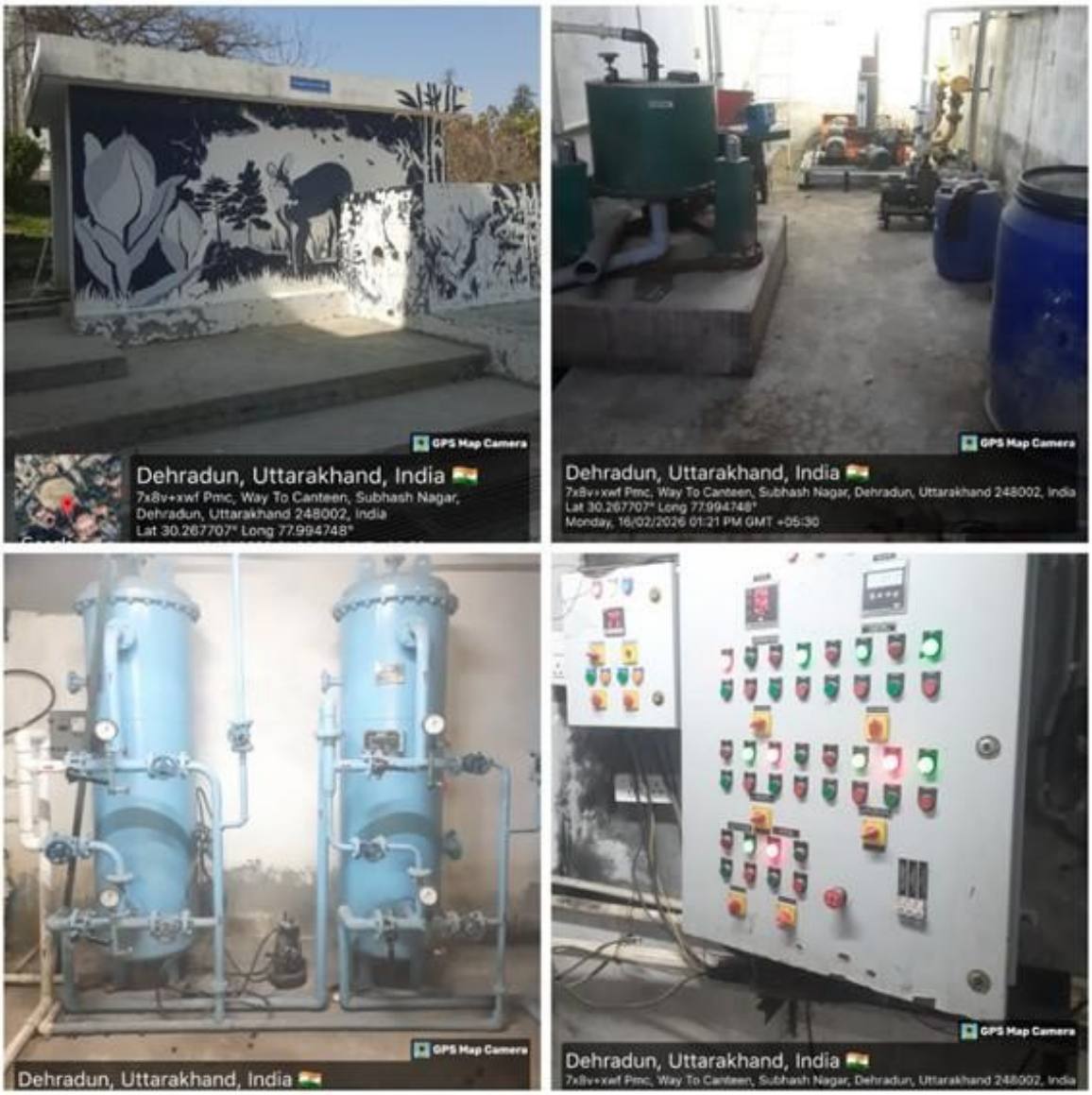


Figure 4-10: Sewage Treatment Plant (STP)

Savings achieved due to STP system Installation is given in the Table 4-3.

S. No.	Description	Unit	Values
1	STP capacity	kLPD	100
2	Quantity of final treated water from STP	kLPD	75
3	Quantity of water reused @ 50% utilization factor	kLPD	37.5
4	No. of working days per year	days	250
5	Annual Quantity of water reused (saved)	kLPD	9375
6	Average water cost	Rs./L	0.086
7	Annual cost savings achieved	Rs. lakh/year	8.0625
8	Investment Cost	Rs. Lakh	30

Table 4-3: Cost Savings from STP System

4.2. Best Practices Implemented for Water Conservation

4.2.1. Low Flow Taps

Low flow taps perform better with less water usage when compared to regular taps. These taps compensate the water pressure and give defined water flow rate, therefore less water wastage & more savings on water bills. The advantages of low flow taps are as follows:

- Saves water with optimized flow rate
- Reduced water bill
- Different flow patterns (shower/Foam)
- Annual Savings up-to 10,000 litres/Year/tap

Features of Aerator for taps:

- The aerator is a small attachment that either fits onto the end of the tap or can be inserted inside of the existing spout. These water saving devices will control the amount of water that flows through the tap without affecting the water pressure as they mix the water with air which will save water and money.
- The aerators will separate a single flow of water into many tiny streams which introduces the air in to the water flow. Also, as there is less space for the water to flow through, the water flow is reduced, resulting in water savings.
- As the water pressure is maintained, most people don't notice a difference in the amount of water coming out of an aerated faucet yet benefit from the water efficiency.
- Tap aerators are of most use to those with older taps which run on average around 15 litres of water per minute. Adding an aerator to an older tap can reduce this to as little as 6 litres of water per minute.
- The biggest water saving benefit is achieved in the bathroom / hand wash / kitchen sinks where we are often turning the taps on and off to wash our hands and for other uses.

The picture of taps with aerators used in the Indoor Sports Club at campus is shown in Figure 4-11.

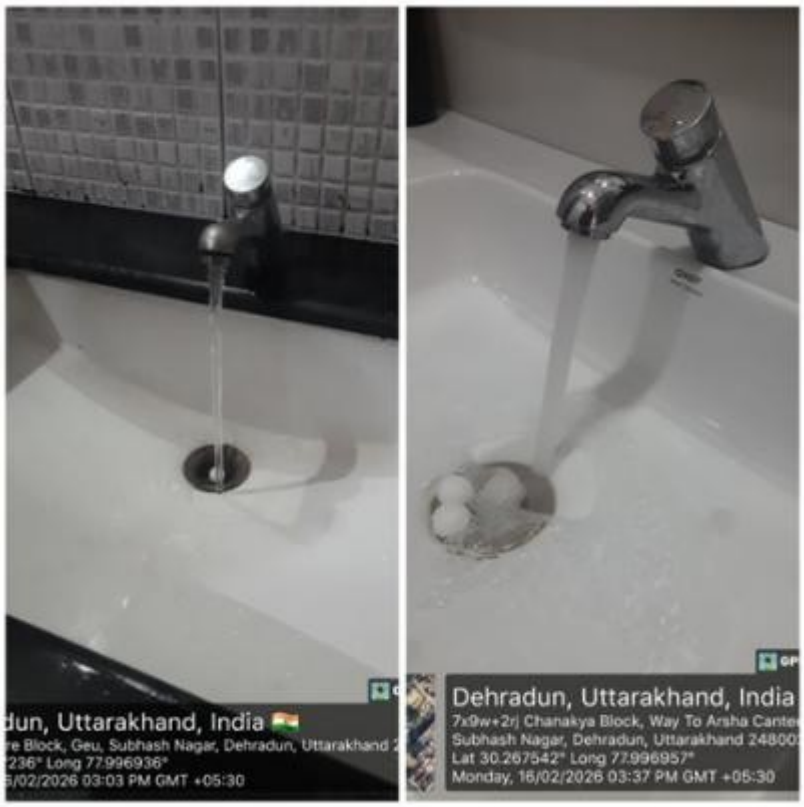


Figure 4-11: Sample Photos of Taps with Aerators

4.2.2. Awareness Posters on Water Conservation

To create an awareness regarding water conservation, sign boards / posters indicating save water, conserve water were made available at appropriate locations like hand wash area, drinking water tap points.

The sample images of awareness poster regarding water conservation is shown in Figure 4-12.



Figure 4-12: Awareness Posters on Water Conservation

5. ENERGY AUDIT

5.1. Facility Description

Graphic Era (Deemed to be) University campus receives power supply from the Uttarakhand Power Corporation Ltd. at HT 11 kV. The 11kV rated HT power supply is stepped down to LT 415V, by one number of 2000 kVA rated transformer. Graphic Era (Deemed to be) University has availed power supply, with connection number XD494835. Transformer unit installed inside University premises is shown in the Figure 5-1.



Figure 5-1: Transformer Yard

The name plate details of transformer are given in Table 5-1.

S. No.	Description	Units	Details
1	Rated Capacity	kVA	2000
2	Rated Voltage Prim/Sec	kV	11/0.415
3	Rated Current Prim/Sec	A	104.97/2782.41
4	Type of Cooling	-	ONAN
5	Frequency	Hz	50
6	Impedance	-	6.25%
7	Phase	-	3
8	Make	-	Sudhir Power Limited

Table 5-1: Name Plate Details of Transformer

The LT supply from the transformer is taken to the main distribution panel located inside the Electrical panel room via power cables.

Power supply cables from the electrical panel room are distributed to the various distribution panels placed inside the campus. From the main electrical LT panel room, power supply is catered to individual areas.

Electrical panel room is as shown in the Figure 5-2.



Figure 5-2: Electrical Panel Room

DG Sets:

Two numbers of DG (Diesel Generator) sets are used for backup power supply, during power failure from UPCL. The DG sets are operated in Auto synchronization mode. After the power failure the DG sets get started in one minute. All DG sets operate separately. Diesel for DG sets are not stored inside the campus. Diesel is filled through mobile diesel supply vehicle. DG sets installed at the University premises are shown in Figure 5-3.



Figure 5-3: Diesel Generator (DG) sets

The details of diesel generator are given in Table 5-2.

S. No.	Description	Rating	Make	Quantity
1	DG-01	1010kVA	Cummins	01
2	DG-02	500kVA	Caterpillar	01

Table 5-2: Details of Diesel Generator

The image of Diesel Generator logbook is shown in Figure 5-4.

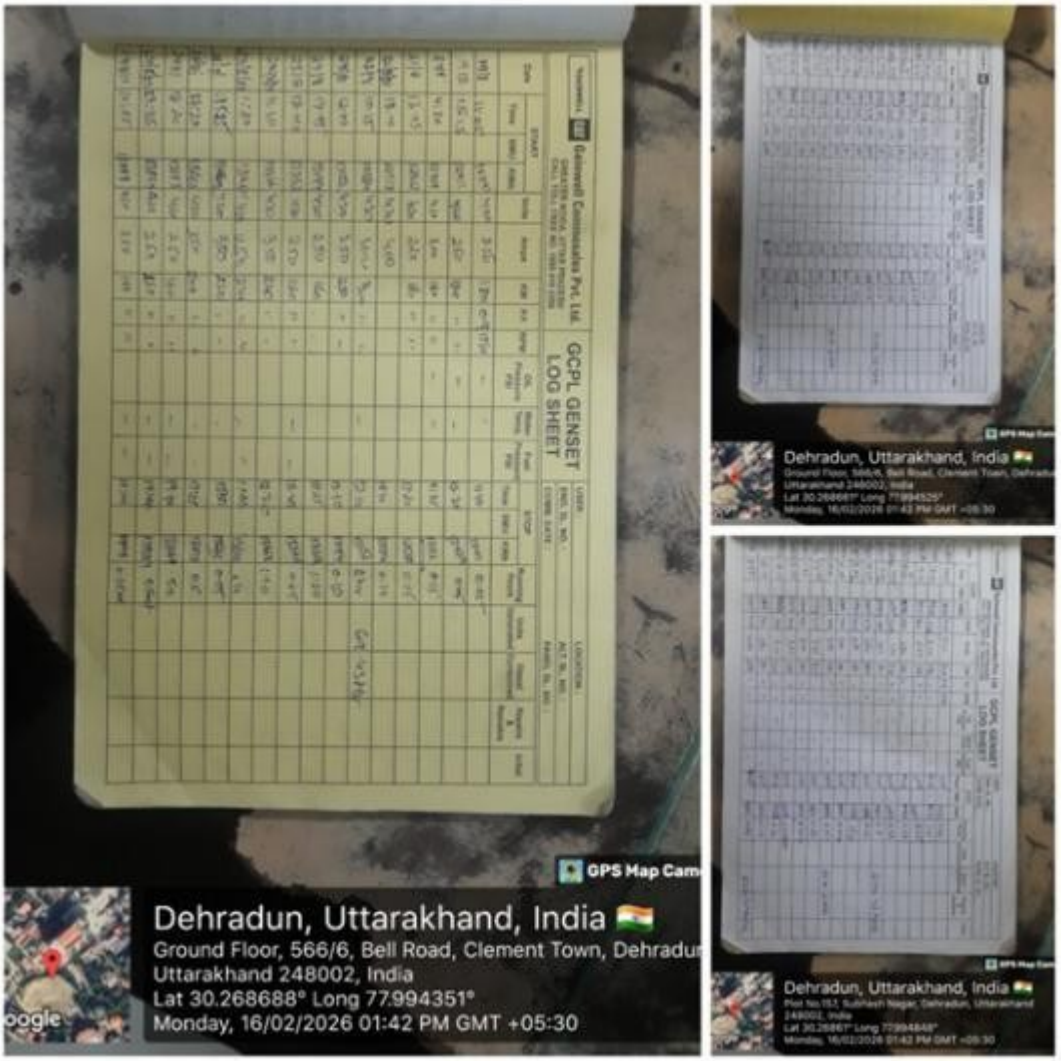


Figure 5-4: Diesel Generator (DG) sets Logbook

5.1.1. Tariff Structure

The sanctioned contract demand of the campus is 591 kVA at specified voltage of 11 kV. Electricity supply from UPCL is billed under RTS-2 schedule of tariffs. Presently the tariff includes demand charges of Rs. 115 for contract load 591 kVA and energy charges of Rs.8.25 per kWh.

5.1.2. Electricity Consumption Data

Details of electricity consumption for the last one year have been collected and Salient features of electrical energy details are given in Table 5-3.

S. No.	Description	Unit	Details
1	Contract Demand	Kva	591
2	Demand Charges for Contract load	Rs. /kVA	115
3	Maximum Demand Recorded during last one year	Kva	579
4	Average Monthly Energy Consumption during last one year	KWh	153622
5	Average System Power Factor		0.97
6	Average Energy Charges considered for savings calculations	Rs./ kWh	8.25

Table 5-3: Electricity Bill Parameters

Figure 5-5 indicates the month wise recorded maximum demand and month wise energy consumption of the University campus for the period January to December 2024.

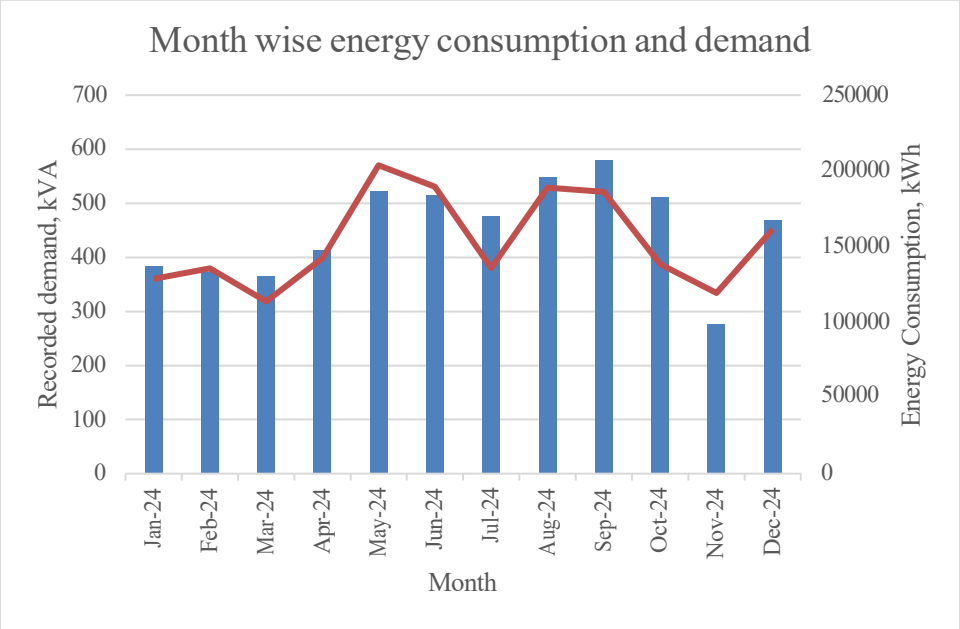


Figure 5-5: Month wise Maximum Demand and Energy Consumption

From the maximum demand curve, it was observed that maximum demand registered during the month of September 2024 was found to be 579 kVA and is the peak demand during the last one year of billing period. Average of registered maximum demand during January 2024 to December 2024 is 453kVA.

From the month wise energy consumption profile, it was observed maximum energy consumption was registered during September 2024. Average monthly energy consumption is 153622 kWh.

5.1.3. Solar Roof Top Photo Voltaic (SRTPV) System

SRTPV (Solar Roof Top Photo Voltaic) system was installed at the top of Graphic Era (Deemed to be) University campus buildings.

The combined capacity of SRTPV installed is of 237 **kWp** rated.

The SRTPV is on-grid system type. During the audit, photo of SRTPV systems is collected and is shown in Figure 5-6.



Figure 5-6: Solar Roof Top PV System

Energy generation and cost savings of 237 kWp is estimated and the same is given in the Table 5-4.

S. No.	Description	Unit	Values
1	Rated Capacity of SRTPV system	kWp	273
2	Average units generated per day	kWh/day/kWp	3
3	No. of working hours per annum	days	350
4	Annual energy generation from SRTPV	kWh/ annum	2,86,650
5	Average energy cost	Rs./kWh	8
6	Annual cost savings due to installation of SRTPV	Rs. Lakh / annum	22.932
7	Total CO2 emission reduction	tCO2	226.45
8	Total investment cost	Rs. Lakh	122.85

Table 5-4: Cost Savings from SRTPV System

5.2. Best Practices Implemented for Energy Conservation

During the study, observations were carried out on the usage of the inventories in the University building premises. In the intension of saving the electricity, various measures have been adopted in the University. Computers and AC units are used only during the working hours, after completion of class hours – fans, lights, computers and AC units are found to be turned OFF. This practice is followed across the University premises (class rooms, labs, staff rooms, office rooms, library and auditoriums).

5.2.1. Day-light Integration

During the audit phase classrooms, Staff-rooms, computer lab, UPS & batteries room and library areas were surveyed for illumination levels and fresh air-circulation. It was observed most of the rooms are well ventilated and day-light integrated; sample photos are shown in Figure 5-7.

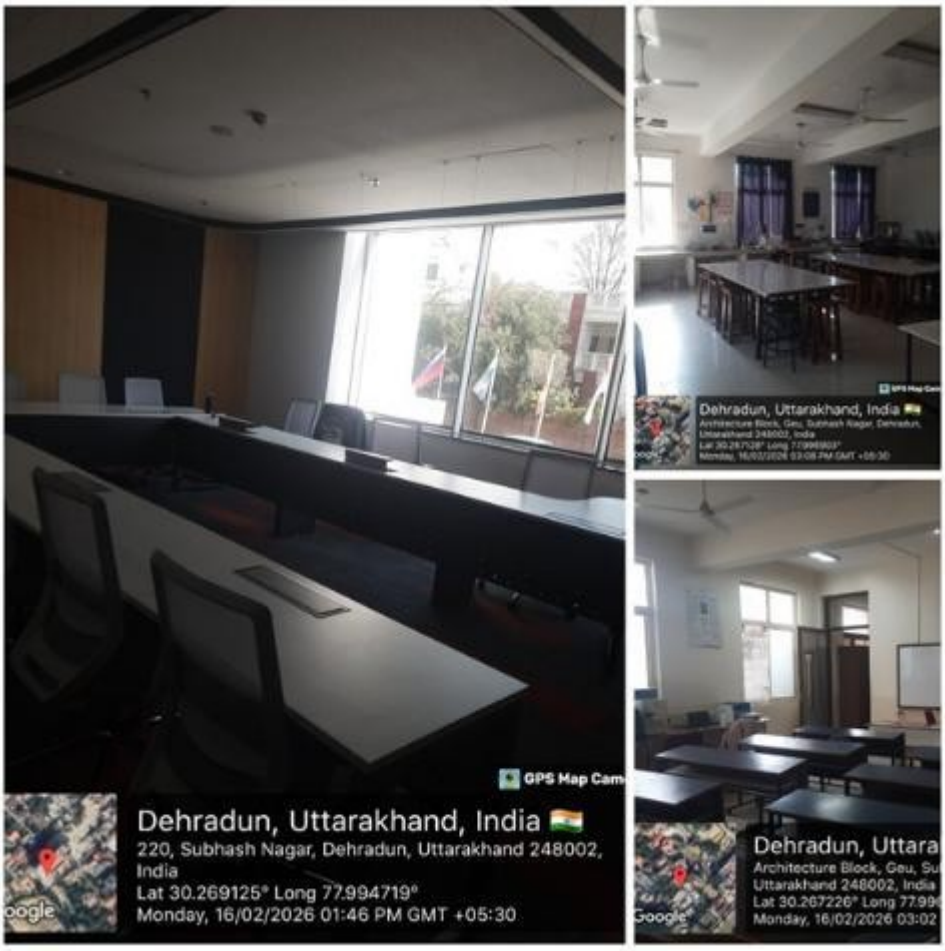


Figure 5-7: Well-Ventilated and Day-Light Integrated Class Rooms

5.2.2. Installation of LED lights

In the campus, LED fixtures are used to conserve energy. LED fixtures are used in the class rooms, staff-rooms, seminar hall corridors, hostels, dining areas, etc. Sample photo of LED lamp used in the some of the location of the University area are shown in Figure 5-8 and 5-9

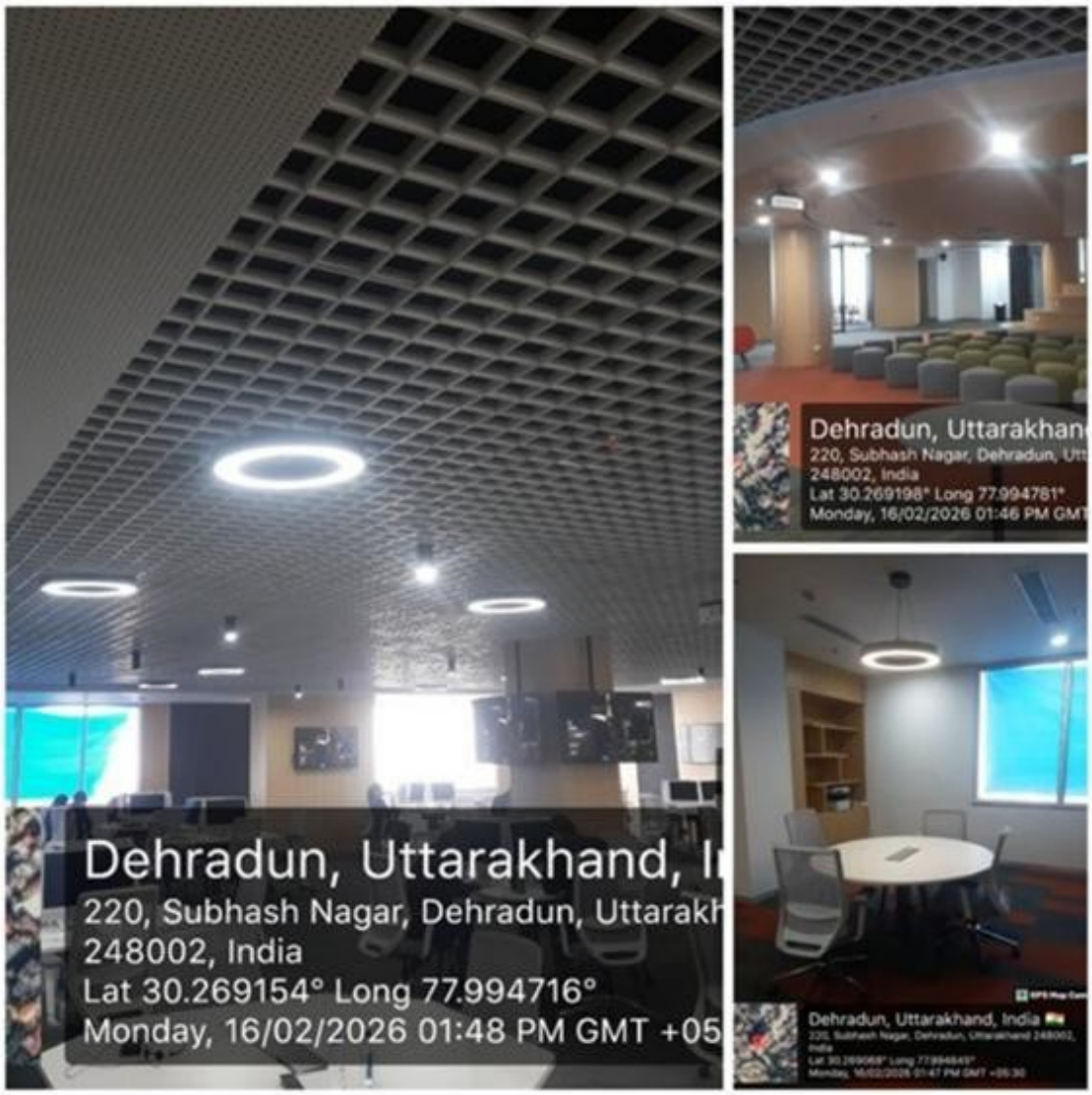




Figure 5-8: LED Lights Installed in Campus



Figure 5-9: University Auditorium

5.2.3. Installation of Digital LED Display

Management have installed digital panels to reduce the marketing waste such as banners and flexes. Sample photo of Digital LED display used in the University is shown in Figure 5-10.



Figure 5-10: Digital LED Display

5.2.4. Installation of SRTPV System

SRTPV (Solar Roof Top Photo Voltaic) system was installed at the terrace of campus buildings.

The capacity of SRTPV installed is of **237kWp** rated.

The SRTPV is on-grid system type. During the audit, photo of SRTPV systems are collected and is shown in Figure 5-11.



Figure 5-11: SRTPV Installed at University

Energy generation and cost savings of 237 kWp is estimated and the same is given in the Table 5-5.

S. No.	Description	Unit	Values
1	Rated Capacity of SRTPV system	kWp	273
2	Average units generated per day	kWh/day/kWp	3
3	No. of working hours per annum	days	350
4	Annual energy generation from SRTPV	kWh/ annum	2,86,650
5	Average energy cost	Rs./kWh	8
6	Annual cost savings due to installation of SRTPV	Rs. Lakh / annum	22.932
7	Total CO2 emission reduction	tCO2	226.45
8	Total investment cost	Rs. Lakh	122.85

Table 5-5: Cost Savings from SRTPV System

5.2.5. Installation of Solar Water Heater

Solar water heaters are installed in girls hostel for generating hot water. Sample photo of solar water heater used in the campus are shown in Figure 5-12.



Figure 5-12: Use of Solar Water Heater

The cost savings by installation of solar water heater are given in Table 5-6.

S. No.	Description	Unit	Values
1	Solar water heater installed	L	67000
2	Total amount of heat produced	kCal/hr	2010000
3	Electricity equivalent	kWh	2337.209302
4	No. of working days per year	days	250
5	Annual electricity savings	kWh	584302.3256
6	Average electricity cost	Rs./kWh	8
7	Annual cost savings achieved per year	Rs. lakh/year	46.74
8	CO2 mitigations per year	Tons/year	461.60
9	Investment Cost	Rs. Lakh	132

Table 5-6: Annual Cost Savings by Installation of Solar Water Heater

5.2.6. Installation of Energy Meters

Energy meters were installed at main panel to monitor the energy consumption of the University. The energy meter readings were entered in kWh log register regularly.

The image of energy meter installed in panel is shown in Figure 5-13.



Figure 5-13: Energy meter

5.2.7. Procurement of LED/LCD Monitors

LED/LCD monitors are used for all the desktop computers in staff rooms and in computer labs. Sample photos of the computer labs are as shown in the Figure 5-14.

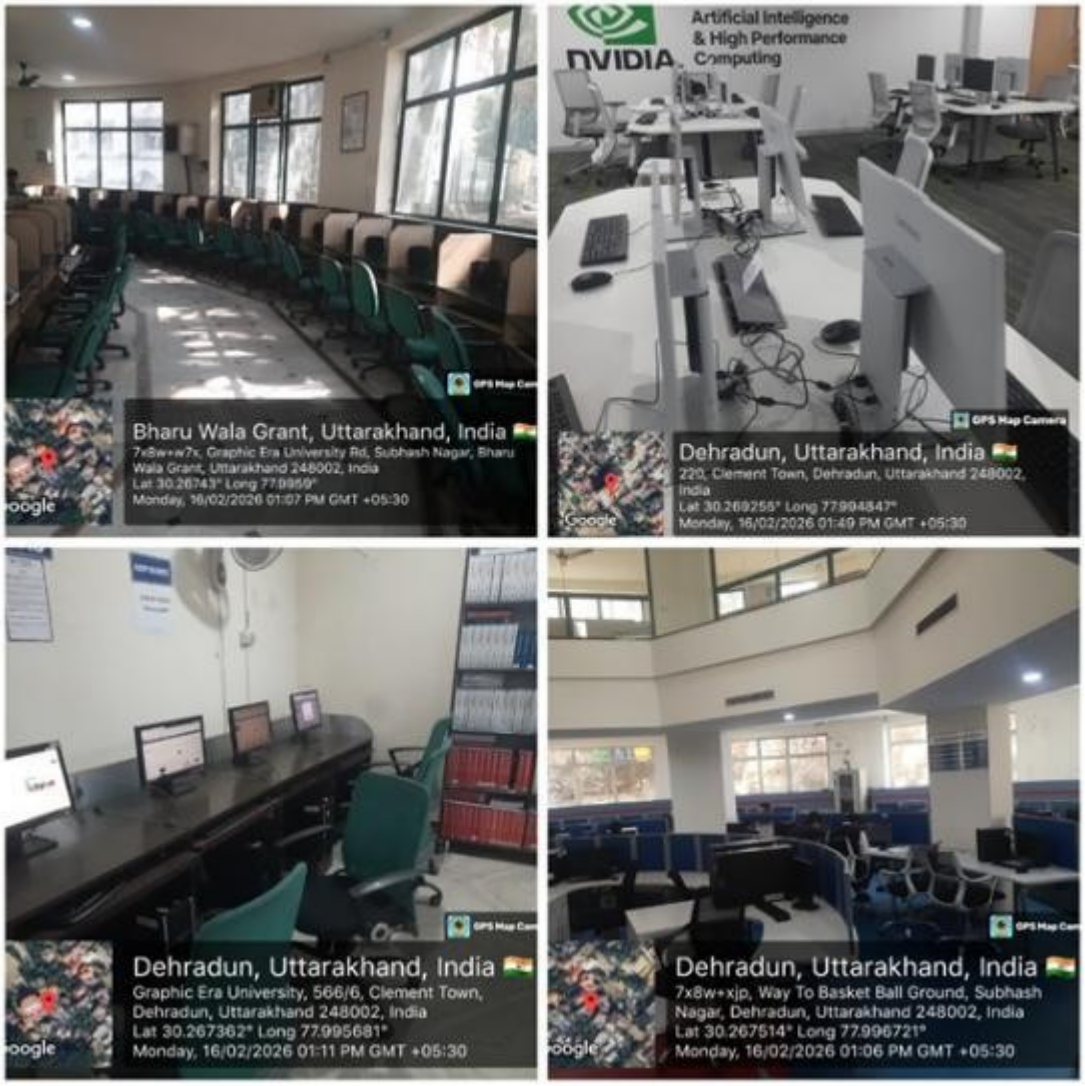


Figure 5-14: Use of LED Monitors in the Computer Labs

5.2.8. Use of Electrical Safety Mats

Electrical safety mats are used placed near each electrical panel to avoid electrical shock risk. The image of the electrical safety mats used is shown in Figure 5-15.



Figure 5-15: Electrical Safety Mats Near Electrical Panel

5.2.9. Automatic Rescue Device for Lifts

Automatic Rescue Device (ARD) is a device installed for an elevator which is only used in case of a power failure in a building. An ARD is extremely useful for preventing passengers from getting trapped inside an Elevator during a power failure.

ARD is installed for the lifts in University premises.

The image of a lift at University is shown in Figure 5-16.

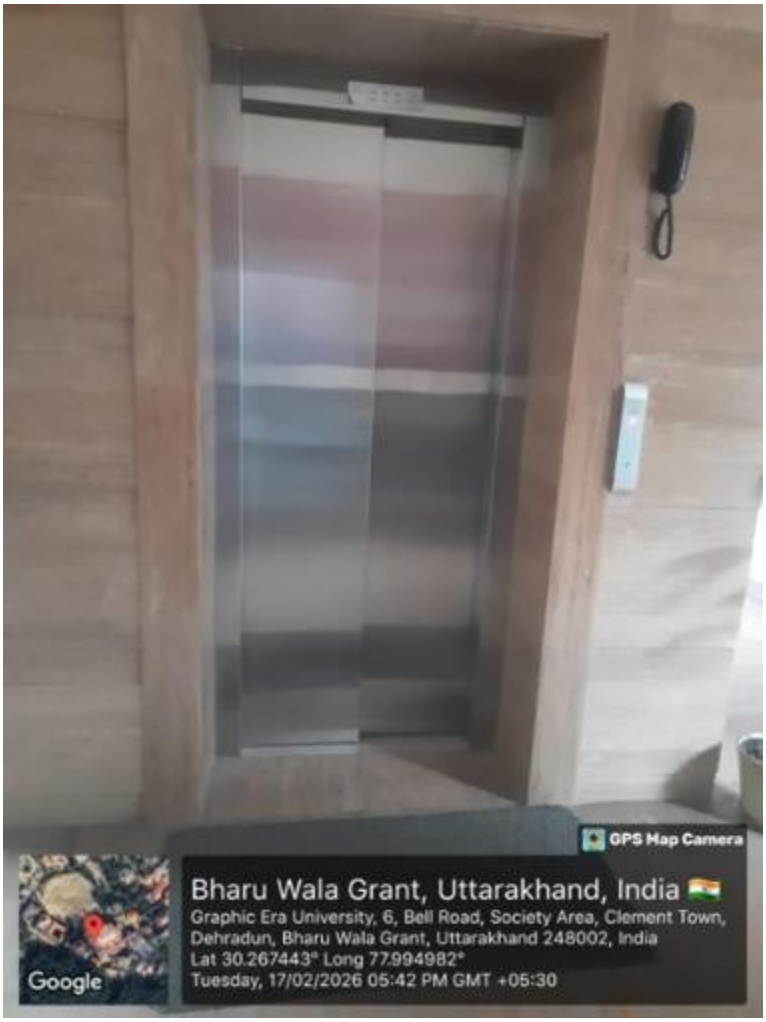


Figure 5-16: Lift

5.2.10. Installation of Streetlights

Solar streetlights have been installed inside the campus. Sample photos of the streetlights are shown in Figure 5-17



Figure 5-17: Solar LED Street Light

Savings achieved due to Solar Streetlights Installation is given in the Table 5-7.

S. No.	Description	Unit	Values
1	Rated Wattage of LED lamps installed	W	40.0
2	Quantity of LED lamps installed	Nos	14.0
3	Rated wattage of lamps used earlier	W	80.0
4	Savings per lamp by installation of LED lamps	W	40.0
5	Total savings	kW	0.6
6	Working hours per day	hours	8.0
7	No. of working days per year	days	350.0
8	Annual electricity savings	kWh	1568.0
9	Average electricity cost	Rs./kWh	8.0
10	Annual cost savings achieved per year	Rs. lakh/year	0.1
11	CO2 mitigations per year	Tons/year	1.2
12	Investment Cost	Rs. Lakh	1.0

Table 5-7: Cost Savings from Solar Streetlights

6. WASTE MANAGEMENT AUDIT

6.1. Facility Description

The study involved carrying out various analyses to realistically assess waste generation.

There are different types of waste generated in the University and explained below.

S. No.	Description	Yes / No	Details
1	E-Waste	Yes	External Agency
2	Hazardous / Chemical Waste	No	NA
3	Solid Waste	Yes	Recycling Unit
4	Dry Leaves	Yes	Compost Unit
5	Food Waste	Yes	Compost Unit
6	Waste Water	Yes	STP
7	Glass Waste	No	NA
8	Unused Materials	Yes	External Agency
9	Plastic Waste	Yes	External Agency

Table 6-1: Types of Waste Generated in the University

6.1.1. Types of Waste

WET WASTE: Wet waste is all the kitchen waste produced in the hostel kitchen. These are the waste, which is collected daily in the canteen, cafeteria etc.

Example: fruit peels, vegetable peels, used tea leaves etc.

DRY WASTE: Dry Waste refers to all waste items that are not considered wet/soiled items.

These are the wastes which are found in classrooms, stationery store etc.

Example: Papers, plastic, bottles etc.

BIO MEDICAL WASTE: Bio medical waste is produced during the diagnosis or treatment of patients.

Example: Sanitary dispenser, incinerator etc.

CHEMICAL WASTE: A chemical waste is any solid, liquid, or gaseous waste material that, if improperly managed or disposed of, may pose substantial hazards to human health and the environment.

Example: phenol, acids, Dettol which are used for cleaning.

WASTE WATER: Waste water is defined as that water which has lost its potential to be used for domestic purpose.

Example: Grey water and back water which are generated from washrooms and kitchens.

HAZARDOUS WASTE: It is a waste which has potential threat to students and teacher's health in the campus.

Example: Chemistry lab i.e., the concentrated chemicals.

E-WASTE: It is a generic term used to describe all types of old, end-of-life or discarded electrical and electronic equipment.

Example: Used keyboards, monitors, batteries, damaged bulbs etc.

SCRAP WASTE: Scrap consists of recyclable materials, usually metals, left over from product manufacturing and consumption.

Example: Cardboards, newspaper, aluminium roofing sheets, and other metallic things etc.

The quantity and type of waste generated in University is given in the Table 6-2.

Description	Values
Total waste generated (KG)	225000
Total e-waste generated (KG)	360
Total recycled and reused waste (in KG)	150000
Total Food Waste generated in Campus (in KG)	5000

Table 6-2: Type and Quantity of Waste Generated

Note: This data was shared by University Personnel

6.1.2. Dry Waste Management

Separate bins are used across the campus for waste collection. Each room (Staff, class rooms, corridors, office, restrooms, and library) is provided with the separate dustbin to segregate waste.

6.1.3. Wet Waste Management

To manage the wet waste generated in the University from canteen kitchens and the leftovers in tiffin boxes brought by students, teachers, and staff, separate bins have been placed on the campus.

The image of wet waste bin is shown in Figure 6-1.

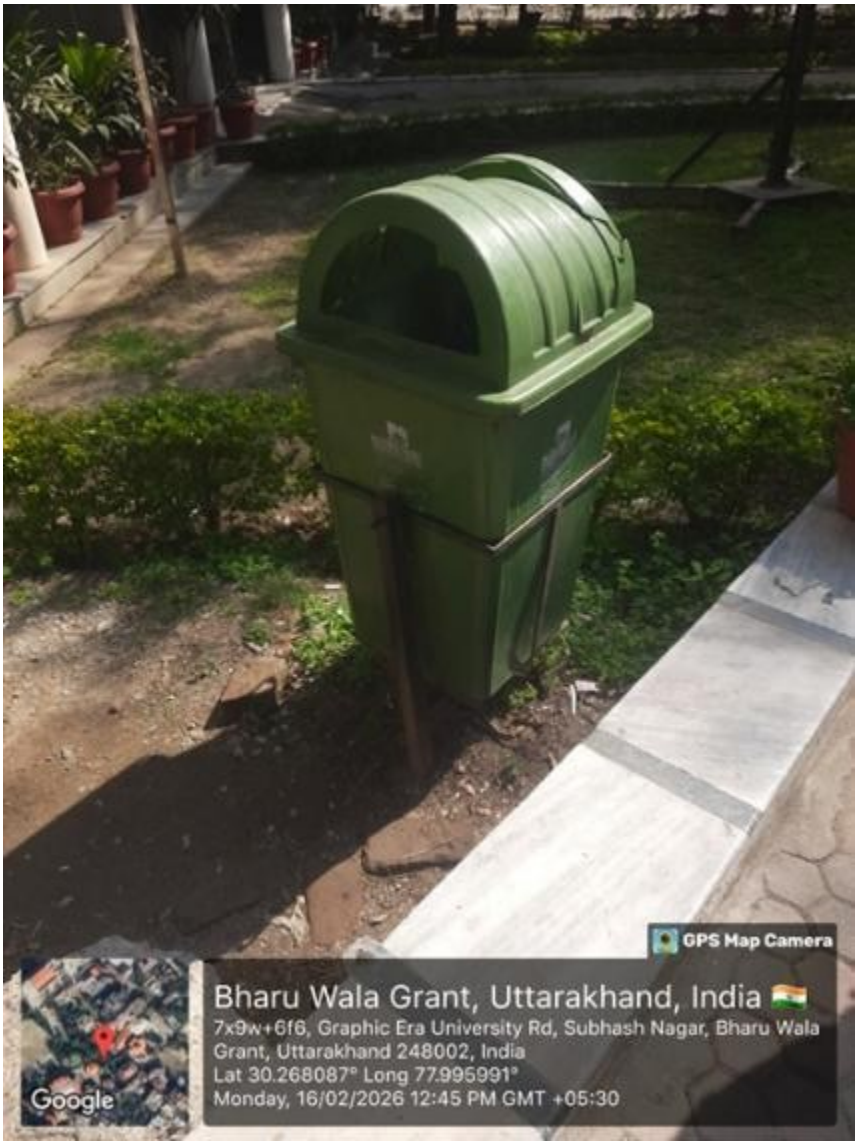


Figure 6-1: Wet Waste Bin

6.1.4. Bio-Medical Waste Management

The biomedical waste generated from the Biotechnology and Microbiology laboratories is systematically segregated and collected in designated hazardous waste bins in accordance with prescribed safety guidelines.

The collected waste is handed over to an authorized government agency, the Medical Pollution Committee, for safe transportation, treatment, and scientific disposal as per applicable biomedical waste management regulations.

Additionally, an autoclave facility is available within the laboratory premises for on-site sterilization and pre-treatment of laboratory waste, ensuring effective microbial inactivation before final disposal.

This structured approach demonstrates the institution's commitment to environmental protection, regulatory compliance, and safe laboratory practices.

The image of Bio-medical waste disposal, SOP and Auto enclave is shown in figure 6-2 to 6-4

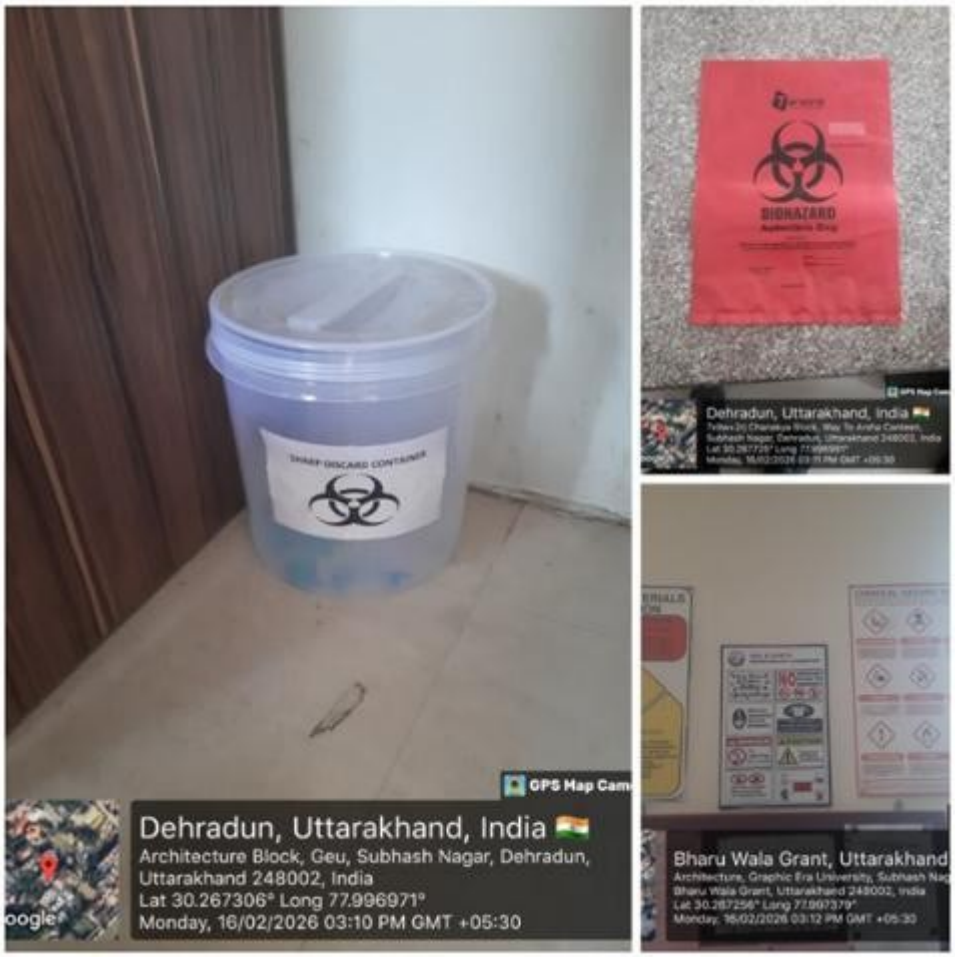


Figure 6-2: Bio-medical Waste Bin



Figure 6-3: Auto Enclave and Certificate of Medical Pollution Control Committee

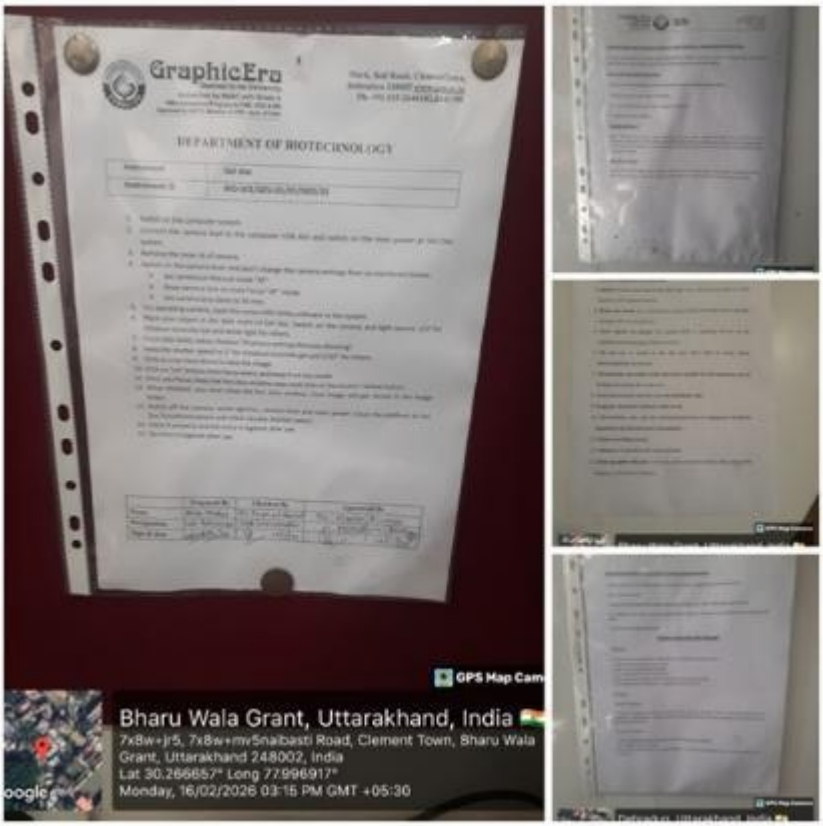


Figure 6-4: SOP of Bio-Medical Waste

6.1.5. Bio-Waste Management

As part of maintaining hygienic environment for the girls, the management has provided the sanitary napkin incinerator in the girls toilet. The picture of the same is shown in Figure 6-5



Figure 6-5: Sanitary Napkin Incinerator at Ground Floor Girls Rest Room in Chanakya Block

6.2. Best Practices Implemented for Waste Management

6.2.1. Sewage Treatment Plant

The procedure for removing contaminants from the wastewater is generally called sewage treatment. It consists of chemical, physical and biological procedures to convert it into an environmentally safe treated effluent.

At Graphic Era (Deemed to be) University there is a Sewage Treatment Plant (STP) which treats wastewater from buildings, hostels, canteen etc. and the treated water is used for gardening and flushing purposes. The STP plant is shown in Figure 6-6.

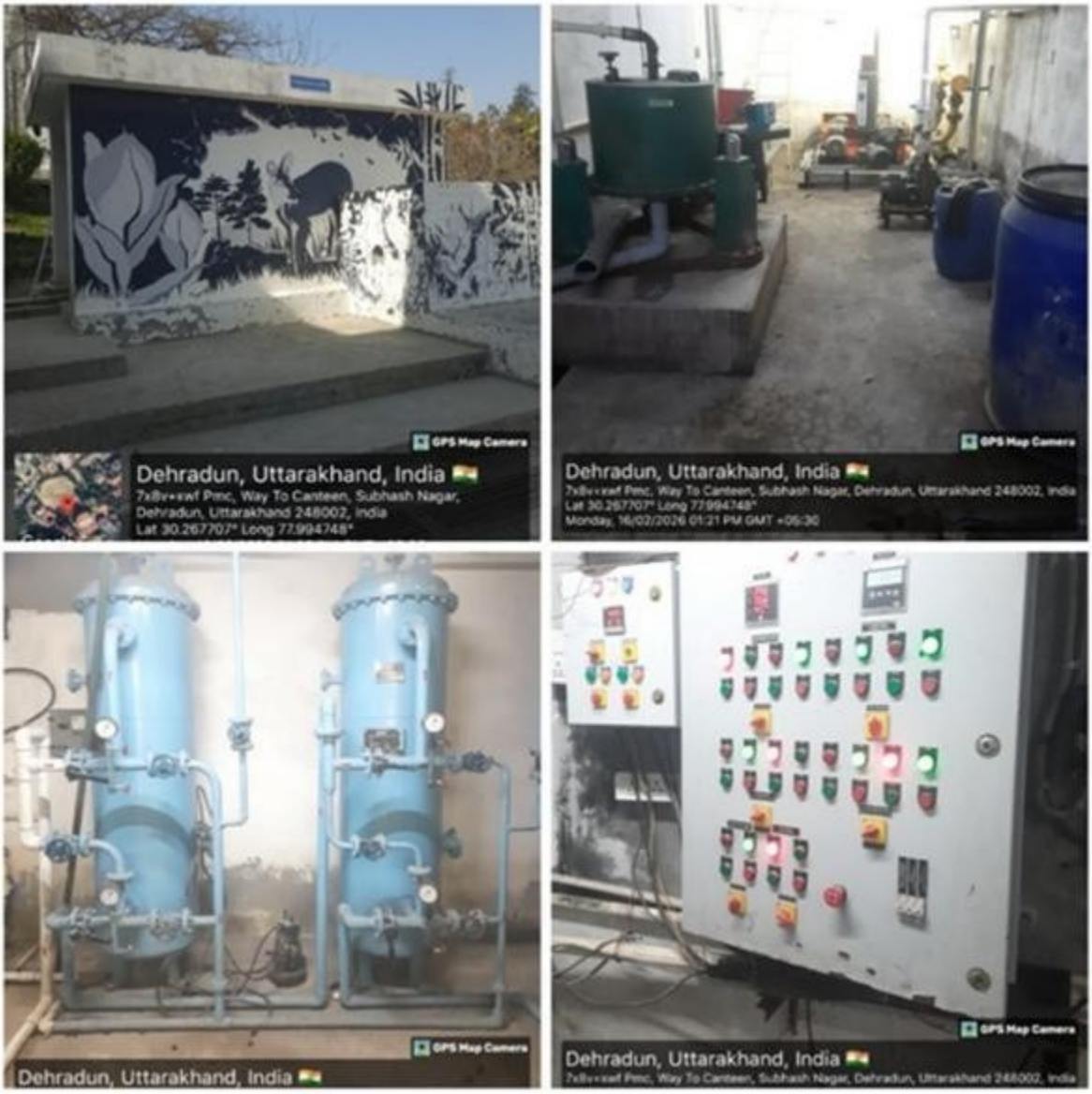


Figure 6-6: STP Plant

6.2.2. Regular Cleaning of Campus

Regular cleaning of university is done to maintain overall hygiene. Cleaning activities are carried out using chemicals wherever necessary. The housekeeping materials like scrub, all-purpose cleaner spray, phenyls, acids, mops, garbage bags, chemical disinfectants, broom sticks, and waste bins are stored and distributed regularly.

The sample image of storage of housekeeping items and logbook details are shown in figure 6-7.

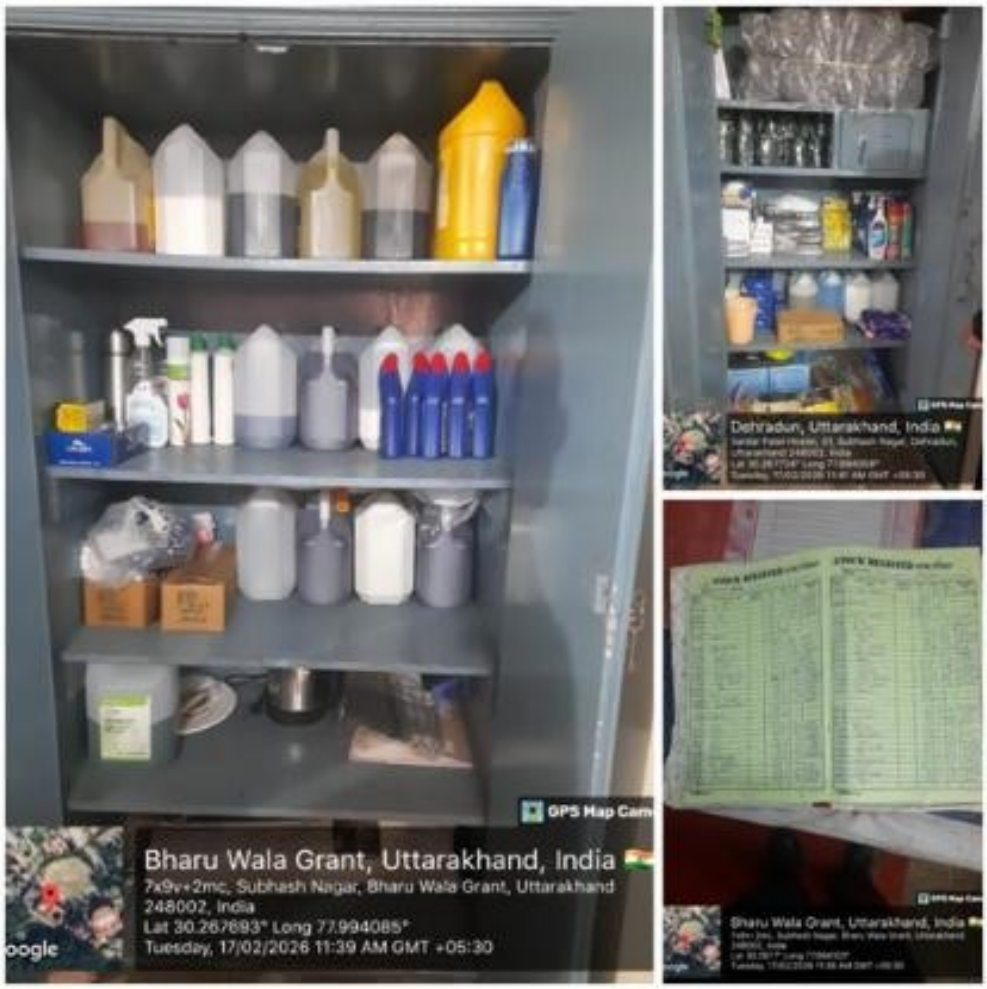


Figure 6-7: Storage of Housekeeping items and logbook

6.2.3. Waste Segregation and Storage

The waste collected from the University premises are kept at waste disposal points. The image of colour coded dust bins at various disposal points is shown in the figure 6-8.

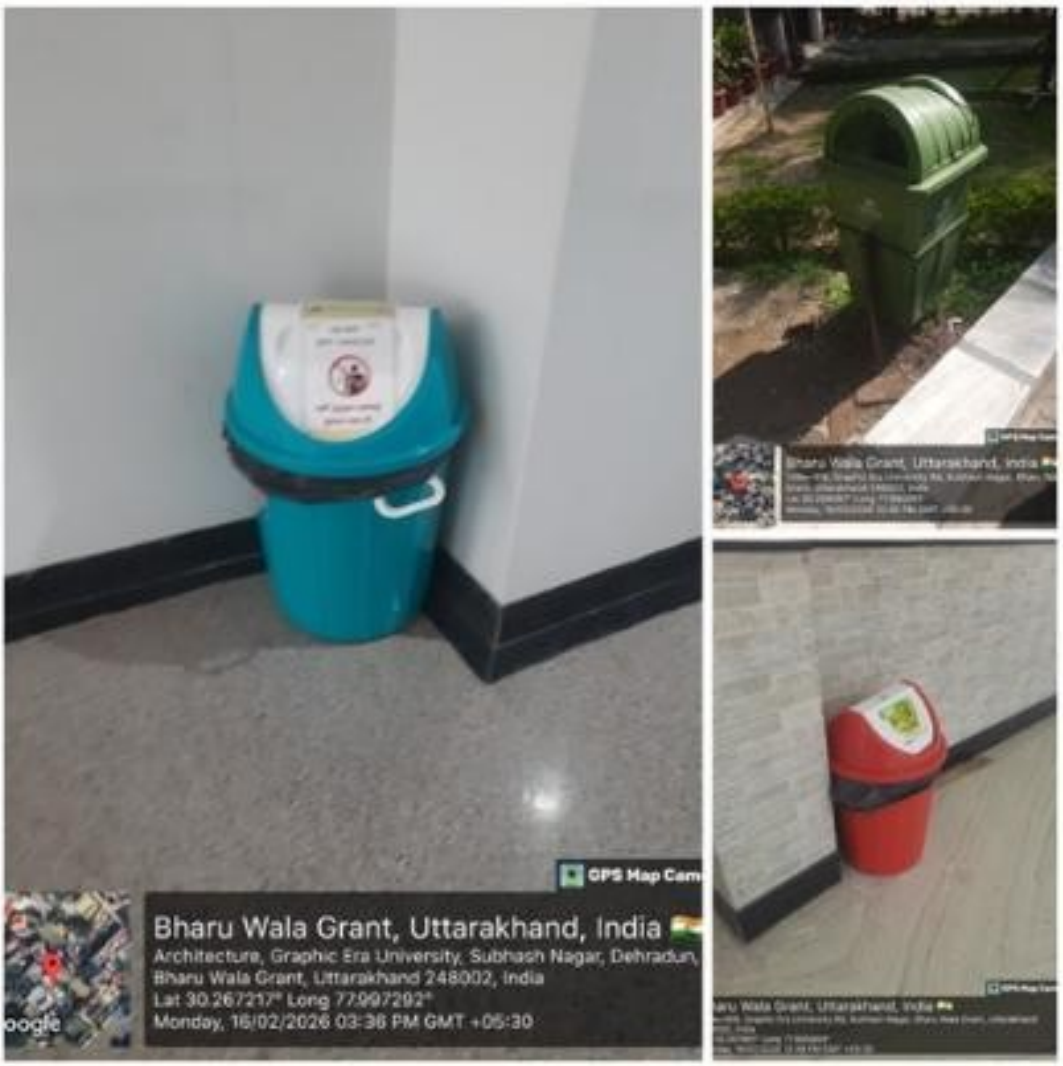


Figure 6-8: Colour Coded Dustbins at various disposal points

6.2.4. Awareness Posters on Waste Management

Awareness posters on waste sorting, use of dustbins, don't waste food use were made available at the University to create awareness among staff and students.

The sample images of awareness posters are shown in Figure 6-9.



Figure 6-9: Awareness Posters on Waste Management

7. GREEN CAMPUS MANAGEMENT AUDIT

7.1. Facility Description

The university is a green campus, lavish, serene atmosphere with variety of plants and trees. The students and faculty are encouraged to adopt cleanliness, making the campus garbage and plastic free zone. Tree plantation programs help in encouraging eco-friendly environment, which provides pure oxygen within the institute.

The maintenance team takes care of the up-keeping of the environment and ensures to keep the surroundings clean. They maintain all the plantations by employing the cleanliness and watering regularly.

There are more variety of trees and well-maintained landscaping of lawns. It was observed different types of herbs, shrubs, species of vegetables & fruits and also, some medicinal plantations in the garden area.

7.1.1. Landscaping with Trees and Plants

Landscaping of the University is worth seeing and reflects aesthetic sense. The various canopy of trees and plants to make the environment pollution free to safeguard the health of all the inmates. The trees provide shade and beautiful ambience. Utmost care is taken to develop and maintain green landscaping by trained gardeners and supervisor. The construction and maintenance team constituted in the University looks after the development and maintenance of the greenery in the campus. Photos taken during the audit are shown in Figures 7-1 to 7-3.


GPS Map Cam
Dehradun, Uttarakhand, India
Graphic Era University, 566/6, Clement Town, Dehradun,
Uttarakhand 248002, India
Lat 30.267447° Long 77.99573°
Monday, 16/02/2026 01:14 PM GMT +05:30
Bharu Wala Grant, Uttarakhand, India
Dehradun, Uttarakhand, India



Figure 7-1: Trees in the Campus



Figure 7-2: Trees with Name Plates



Figure 7-3: Trees near Parking area

7.1.2. Plantations and Lawn

Photos taken during the audit are shown in the following Figures 7.4 & 7.5.

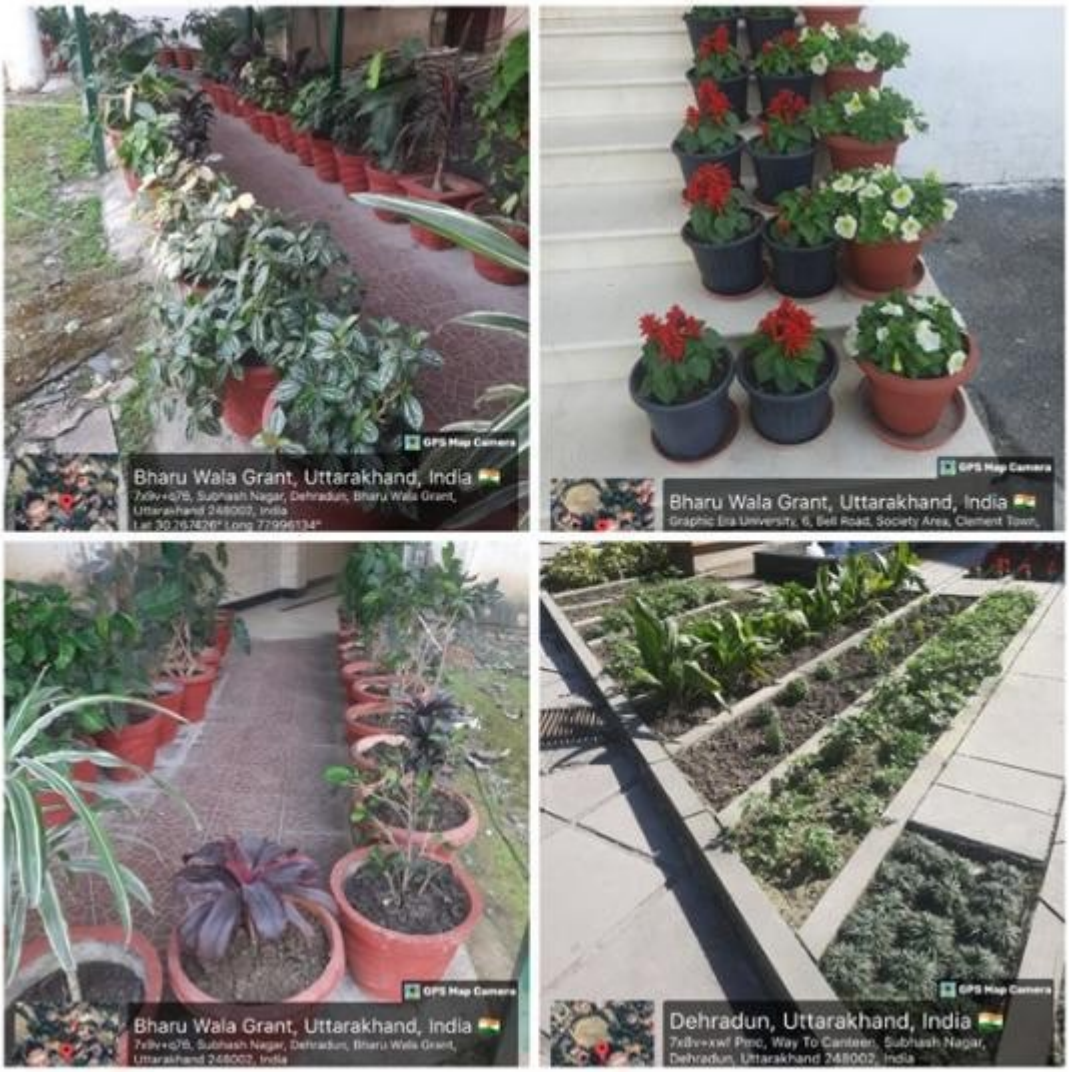


Figure 7-4: Plantation in the Campus Area

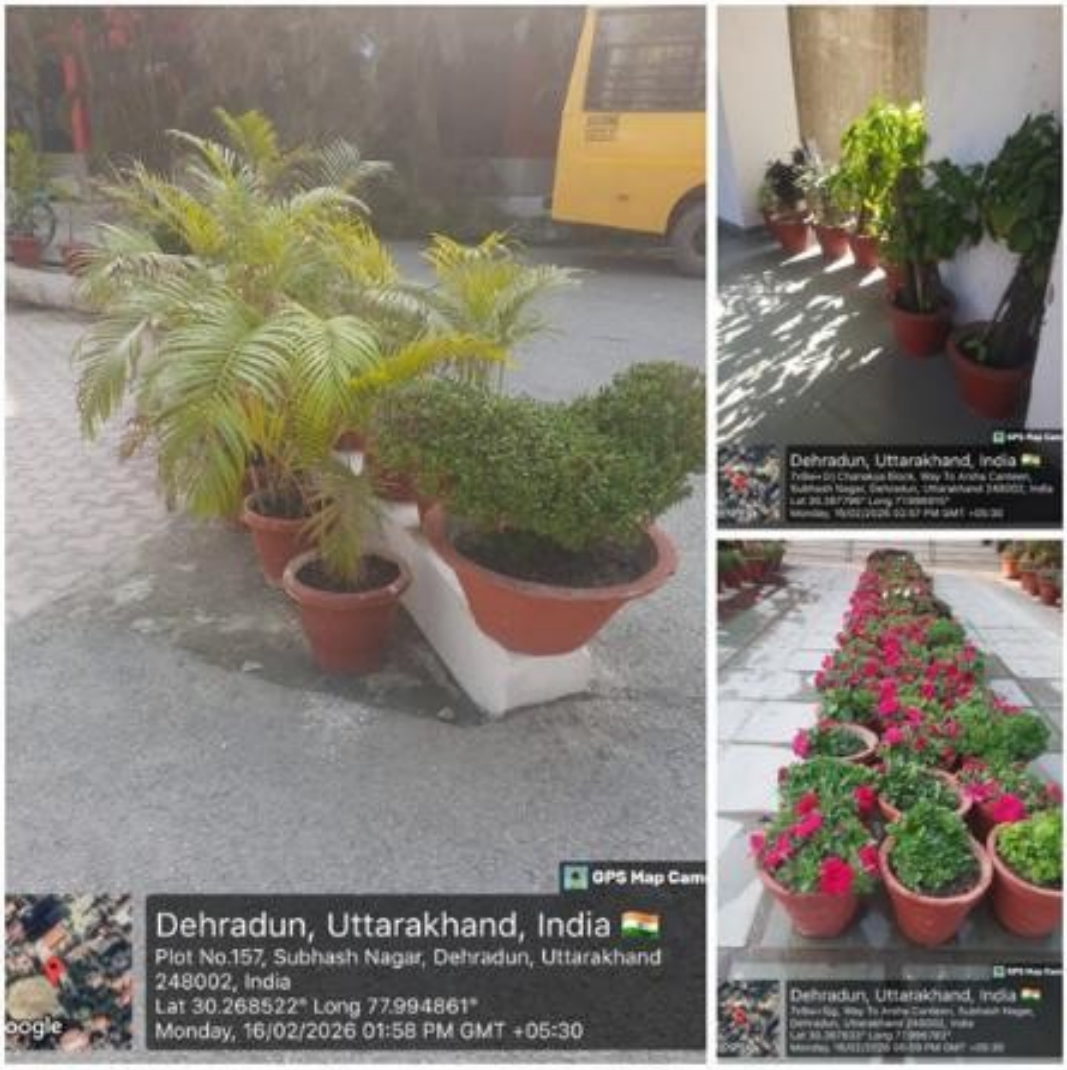
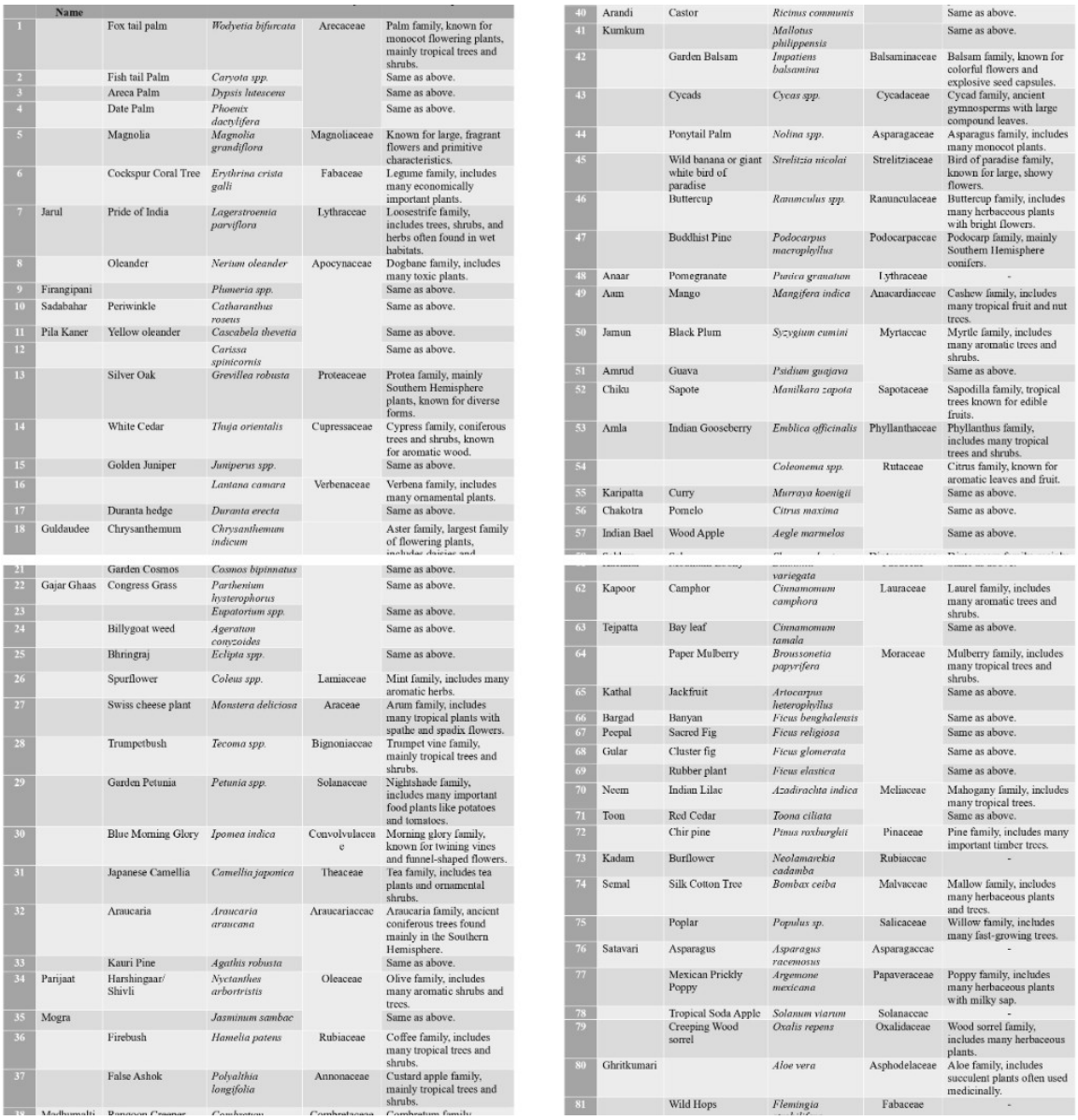


Figure 7-5: Plantation Around Main Campus



	Name				
1		Fox tail palm	*Wodyetia bifurcata*	Arecaceae	Palm family, known for monocot flowering plants, mainly tropical trees and shrubs.
2		Fish tail Palm	*Caryota spp.*		Same as above.
3		Areca Palm	*Dypsis lutescens*		Same as above.
4		Date Palm	*Phoenix dactylifera*		Same as above.
5		Magnolia	*Magnolia grandiflora*	Magnoliaceae	Known for large, fragrant flowers and primitive characteristics.
6		Cockspur Coral Tree	*Erythrina crista galli*	Fabaceae	Legume family, includes many economically important plants.
7	Jarul	Pride of India	*Lagerstroemia parviflora*	Lythraceae	Loosestrife family, includes trees, shrubs, and herbs often found in wet habitats.
8		Oleander	*Nerium oleander*	Apocynaceae	Dogbane family, includes many toxic plants.
9	Firangipani		*Plumeria spp.*		Same as above.
10	Sadabahar	Periwinkle	*Catharanthus roseus*		Same as above.
11	Pila Kaner	Yellow oleander	*Cascabela thevetia*		Same as above.
12			*Carissa spinicornis*		Same as above.
13		Silver Oak	*Grevillea robusta*	Proteaceae	Protea family, mainly Southern Hemisphere plants, known for diverse forms.
14		White Cedar	*Thuja orientalis*	Cupressaceae	Cypress family, coniferous trees and shrubs, known for aromatic wood.
15		Golden Juniper	*Juniperus spp.*		Same as above.
16			*Lantana camara*	Verbenaceae	Verbena family, includes many ornamental plants.
17		Duranta hedge	*Duranta erecta*		Same as above.
18	Guldaudee	Chrysanthemum	*Chrysanthemum indicum*		Aster family, largest family of flowering plants,
21		Garden Cosmos	*Cosmos bipinnatus*		Same as above.
22	Gajar Ghaas	Congress Grass	*Parthenium hysterophorus*		Same as above.
23			*Eupatorium spp.*		Same as above.
24		Billygoat weed	*Ageratum conyzoides*		Same as above.
25		Bhringraj	*Eclipta spp.*		Same as above.
26		Spurflower	*Coleus spp.*	Lamiaceae	Mint family, includes many aromatic herbs.
27		Swiss cheese plant	*Monstera deliciosa*	Araceae	Arum family, includes many tropical plants with spathe and spadix flowers.
28		Trumpetbush	*Tecoma spp.*	Bignoniaceae	Trumpet vine family, mainly tropical trees and shrubs.
29		Garden Petunia	*Petunia spp.*	Solanaceae	Nightshade family, includes many important food plants like potatoes and tomatoes.
30		Blue Morning Glory	*Ipomea indica*	Convolvulaceae	Morning glory family, known for twining vines and funnel-shaped flowers.
31		Japanese Camellia	*Camellia japonica*	Theaceae	Tea family, includes tea plants and ornamental shrubs.
32		Araucaria	*Araucaria araucana*	Araucariaceae	Araucaria family, ancient coniferous trees found mainly in the Southern Hemisphere.
33		Kauri Pine	*Agathis robusta*		Same as above.
34	Parijaat	Harshingaar/ Shivli	*Nyctanthes arbortristis*	Oleaceae	Olive family, includes many aromatic shrubs and trees.
35	Mogra		*Jasminum sambac*		Same as above.
36		Firebush	*Hamelia patens*	Rubiaceae	Coffee family, includes many tropical trees and shrubs.
37		False Ashok	*Polyalthia longifolia*	Annonaceae	Custard apple family, mainly tropical trees and shrubs.
40	Arandi	Castor	*Ricinus communis*		Same as above.
41	Kumkum		*Mallotus philippensis*		Same as above.
42		Garden Balsam	*Impatiens balsamina*	Balsaminaceae	Balsam family, known for colorful flowers and explosive seed capsules.
43		Cycads	*Cycas spp.*	Cycadaceae	Cycad family, ancient gymnosperms with large compound leaves.
44		Ponytail Palm	*Nolina spp.*	Asparagaceae	Asparagus family, includes many monocot plants.
45		Wild banana or giant white bird of paradise	*Strelitzia nicolai*	Strelitziaceae	Bird of paradise family, known for large, showy flowers.
46		Buttercup	*Ranunculus spp.*	Ranunculaceae	Buttercup family, includes many herbaceous plants with bright flowers.
47		Buddhist Pine	*Podocarpus macrophyllus*	Podocarpaceae	Podocarp family, mainly Southern Hemisphere conifers.
48	Anaar	Pomegranate	*Punica granatum*	Lythraceae	-
49	Aam	Mango	*Mangifera indica*	Anacardiaceae	Cashew family, includes many tropical fruit and nut trees.
50	Jamun	Black Plum	*Syzygium cumini*	Myrtaceae	Myrtle family, includes many aromatic trees and shrubs.
51	Amrud	Guava	*Psidium guajava*		Same as above.
52	Chiku	Sapote	*Manilkara zapota*	Sapotaceae	Sapodilla family, tropical trees known for edible fruits.
53	Amla	Indian Gooseberry	*Emblica officinalis*	Phyllanthaceae	Phyllanthus family, includes many tropical trees and shrubs.
54			*Coleonema spp.*	Rutaceae	Citrus family, known for aromatic leaves and fruit.
55	Karipatta	Curry	*Murraya koenigii*		Same as above.
56	Chakotra	Pomelo	*Citrus maxima*		Same as above.
57	Indian Bael	Wood Apple	*Aegle marmelos*		Same as above.
			variegata		
62	Kapoor	Camphor	*Cinnamomum camphora*	Lauraceae	Laurel family, includes many aromatic trees and shrubs.
63	Tejpatta	Bay leaf	*Cinnamomum tamala*		Same as above.
64		Paper Mulberry	*Broussonetia papyrifera*	Moraceae	Mulberry family, includes many tropical trees and shrubs.
65	Kathal	Jackfruit	*Artocarpus heterophyllus*		Same as above.
66	Bargad	Banyan	*Ficus benghalensis*		Same as above.
67	Peepal	Sacred Fig	*Ficus religiosa*		Same as above.
68	Gular	Cluster fig	*Ficus glomerata*		Same as above.
69		Rubber plant	*Ficus elastica*		Same as above.
70	Neem	Indian Lilac	*Azadirachta indica*	Meliaceae	Mahogany family, includes many tropical trees.
71	Toon	Red Cedar	*Toona ciliata*		Same as above.
72		Chir pine	*Pinus roxburghii*	Pinaceae	Pine family, includes many important timber trees.
73	Kadam	Burflower	*Neolamarckia cadamba*	Rubiaceae	-
74	Semal	Silk Cotton Tree	*Bombax ceiba*	Malvaceae	Mallow family, includes many herbaceous plants and trees.
75		Poplar	*Populus sp.*	Salicaceae	Willow family, includes many fast-growing trees.
76	Satavari	Asparagus	*Asparagus racemosus*	Asparagaceae	-
77		Mexican Prickly Poppy	*Argemone mexicana*	Papaveraceae	Poppy family, includes many herbaceous plants with milky sap.
78		Tropical Soda Apple	*Solanum viarum*	Solanaceae	-
79		Creeping Wood sorrel	*Oxalis repens*	Oxalidaceae	Wood sorrel family, includes many herbaceous plants.
80	Ghritkumari		*Aloe vera*	Asphodelaceae	Aloe family, includes succulent plants often used medicinally.
81		Wild Hops	*Flemingia*	Fabaceae	-

Figure 7-6: List of plants and trees

7.2. Best Practices Implemented for Green Campus Management

The maintenance staff members do periodic checks and maintain records for the same. Many initiatives are taken by the management to inculcate the eco-friendly culture among the student community. The green campus provides the facilities such as rain water harvesting, well grown plantations and lawn all around the campus.

- Green landscaping with trees, plants like vegetables, fruits and medicinal plants; lawns
- Paperless office: All communication regarding academics and administration are sent as e-mails and messages to staff members and students that contributes paperless communication

7.2.1. Regular maintenance of Greeneries

The greeneries within the campus are maintained properly with dedicated garden maintenance staff. They proper maintenance like weeding, lawn care and watering etc., The sample images of garden maintenance are shown in Figure 7-7.

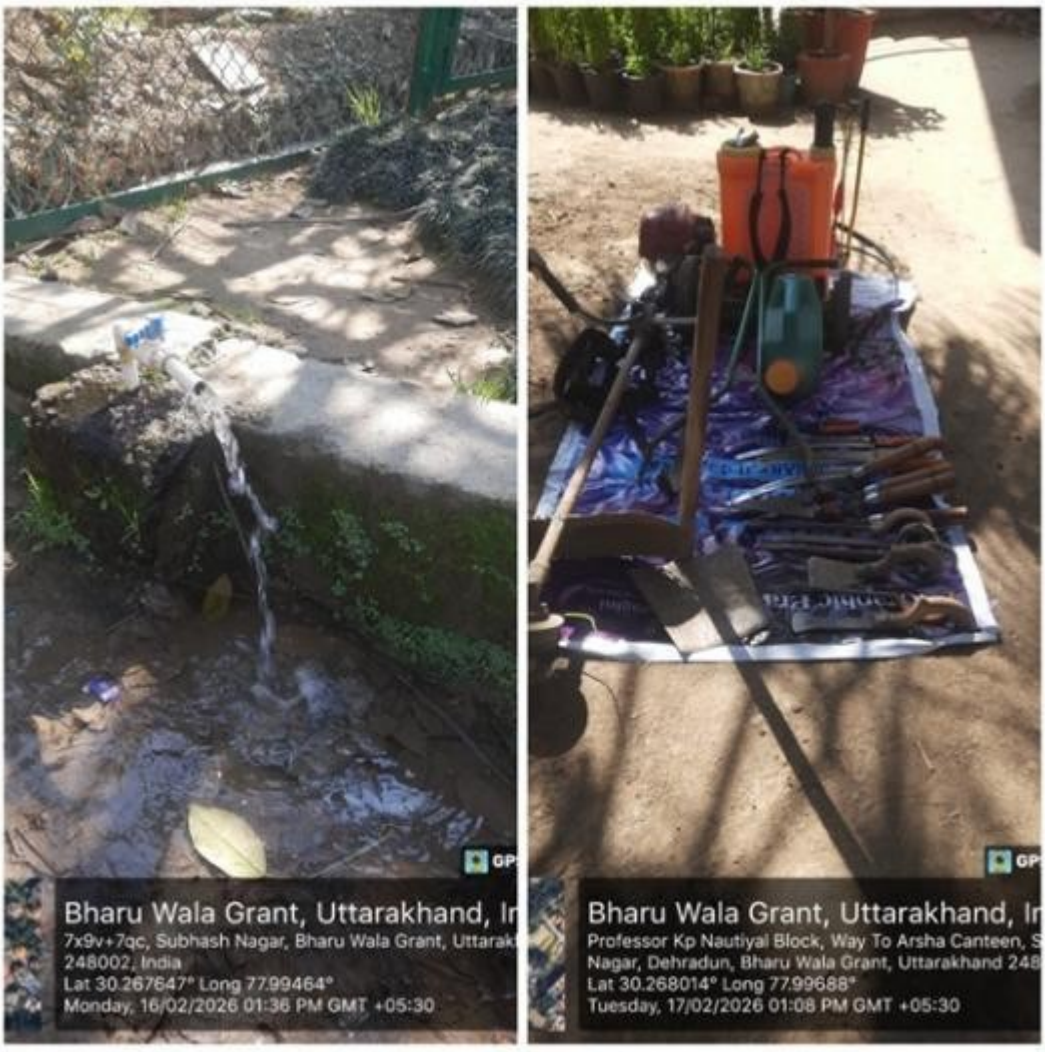


Figure 7-7: Garden Maintenance Activity

8. ENVIRONMENT AUDIT (CARBON FOOTPRINT ANALYSIS)

8.1. Facility Description

The carbon footprint is "the total amount of greenhouse gas (GHG) emissions caused by an organization, event or product". Global warming and climate change are the foremost environmental challenges facing the world today. It is our responsibility to minimize the consumption of energy and hence reduce the emissions of greenhouse gases.

To analysis the carbon footprint, transportation details of students and staff are collected as below:

1. Whether University provides transport facility for staff and students (Yes/No)? Yes
2. Number (or Percentage) of staff using transport services provided by university: 7%
3. Number (or Percentage) of students using transport services provided by university: 70%
4. Number (or Percentage) of Staff using public transport: 26%
5. Number (or Percentage) of Staff using Bike: 40%
6. Number (or Percentage) of Staff using Car: 31%
7. Number (or Percentage) of students using public transport: 6%
8. Number (or Percentage) of students using Car: 4%
9. Number (or Percentage) of students using Bike: 10%

8.2. Best Practices Implemented for Environment Conservation

8.2.1. Encouraging for Usage of Electric Vehicles

The University management is recommending and encouraging the staff and students to use the public transport and electric vehicles, to reduce the carbon foot prints.

Electric bug are using inside the campus. During audit pictures of electric bug is taken and the same is given in Figure 8-1.

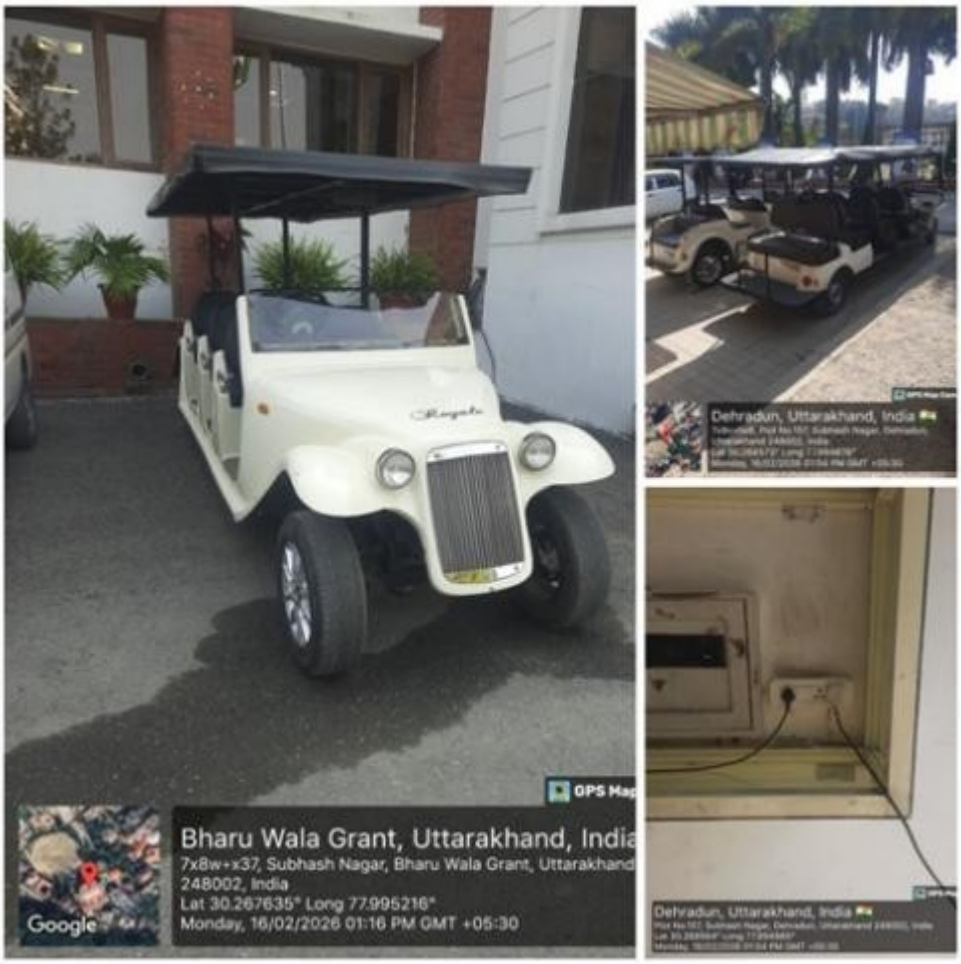


Figure 8-1: Electric Bug and Charging Point

8.2.2. Ramp for Physically Challenged Persons

Wheelchair ramps enable physically disabled as well as elderly people to enjoy complete freedom, as they allow users to move in and around the campus safely. A ramp facility available is shown in Figure 8-2.

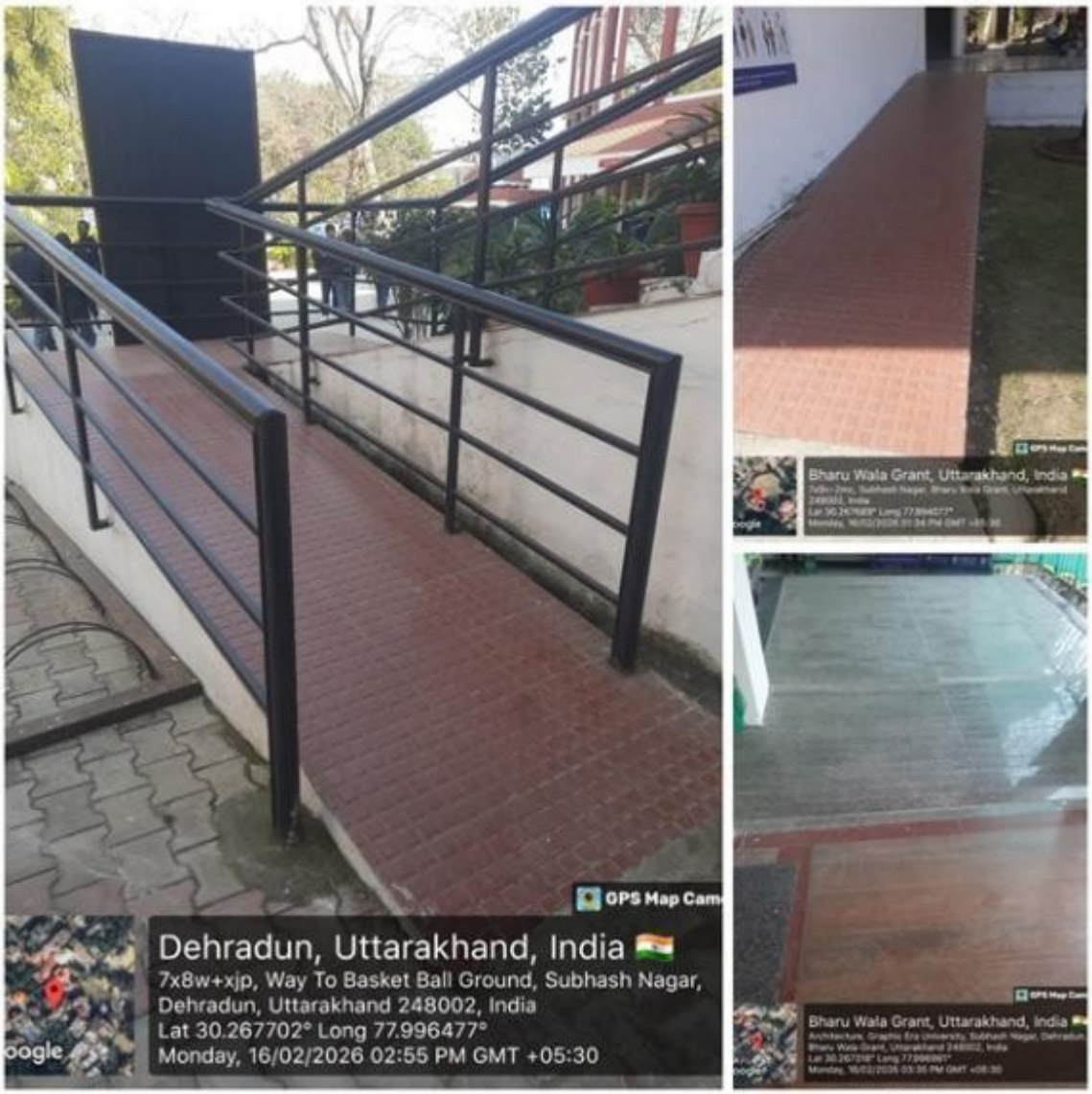


Figure 8-2: Ramp Facility

8.2.3. Transport Facility for Students

University facilitates the safe and reliable transportation by contract buses, of students and staff from Ahmedabad and Vadodara.

To ensure the safety and security of all commuters, buses are regularly inspected, checked, and cleaned.

The sample image of transport facility is shown in Figure 8-3.



Figure 8-3: Transport Facility for Students

The detail of Eco-Friendly transportation is given in the Table 8-1.

Description	Values
Number of eco-friendly transportation facilities with capacity	32
Total capacity of eco-friendly transportation	55

Table 8-1: Details of Eco-Friendly transportation

Note: This data was shared by University Personnel

8.2.4. Installation of SRTPV System

SRTPV (Solar Roof Top Photo Voltaic) system is installed at the top of Graphic Era (Deemed to be) University campus building.

The rated capacity of installed SRTPV system is of 237 **kWp**.

The SRTPV is on-grid system type. During the audit, photo of SRTPV systems are collected and are shown in Figure 8.4.



Figure 8-4: SRTPV Installed at University

8.2.5. Usage of LED Lights

In the campus, only LED fixtures are used to conserve energy. LED fixtures are used in the class rooms, staff-rooms, seminar hall corridors, hostel, dining area, etc. Sample photo of LED lamp used in the some of the location of the University area are shown in Figure 8-5.

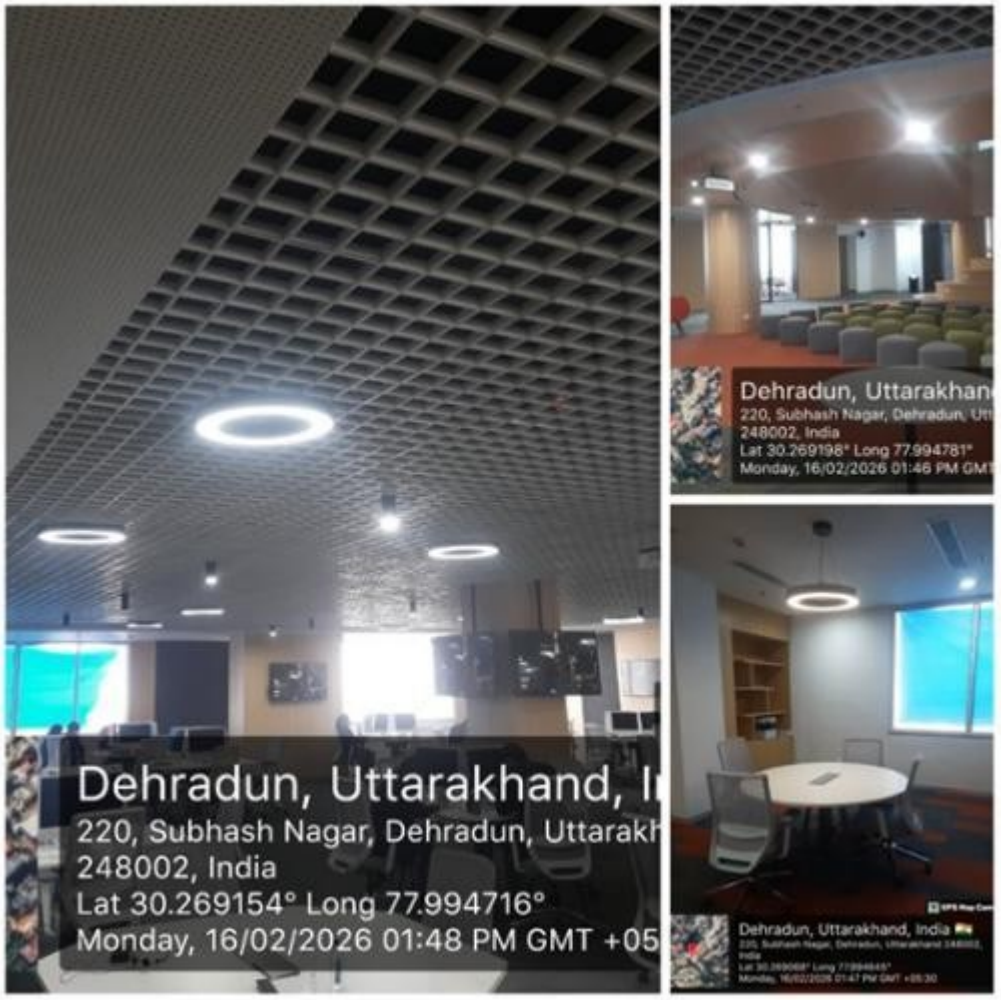


Figure 8-5: LED Lights Installed in Campus

8.2.6. Installation of Solar Water Heater

Solar water heaters are installed in girls hostels for generating hot water. Sample photo of solar water heater used in the campus is shown in Figure 8-6.



Figure 8-6: Use of Solar Water Heater

8.2.7. Regular Cleaning of Campus

Regular cleaning of university is done to maintain overall hygiene. Cleaning activities are carried out using chemicals wherever necessary. The housekeeping materials like scrub, all-purpose cleaner spray, phenyls, acids, mops, garbage bags, chemical disinfectants, broom sticks, and waste bins are stored and distributed regularly.

The sample image of storage of housekeeping items and log book details are shown in figure 8-7.

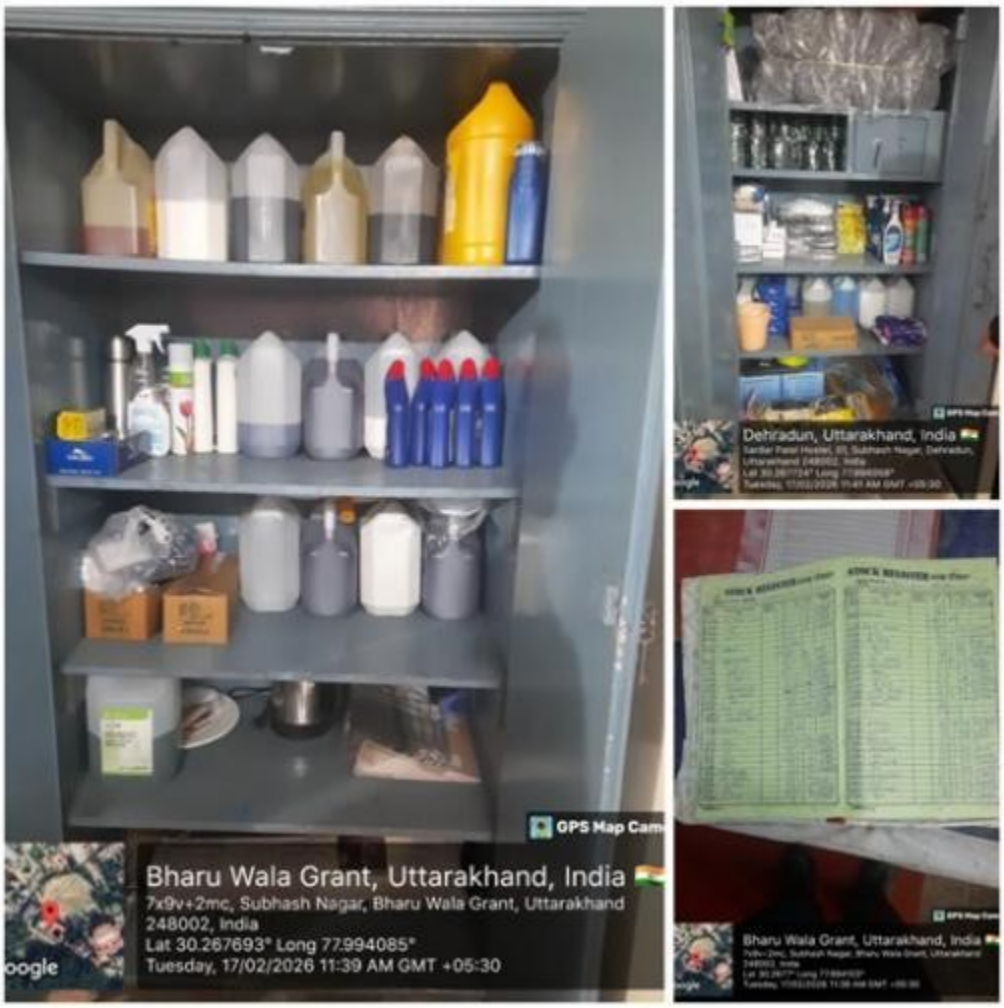


Figure 8-7: Storage of Housekeeping items and logbook

8.2.8. Waste Segregation and Storage

The waste collected from the University premises are segregated and kept at waste disposal point. The wastes are segregated as plastic waste, PET bottle waste, paper waste, food waste and vegetable waste. The wastes are disposed to external agencies.

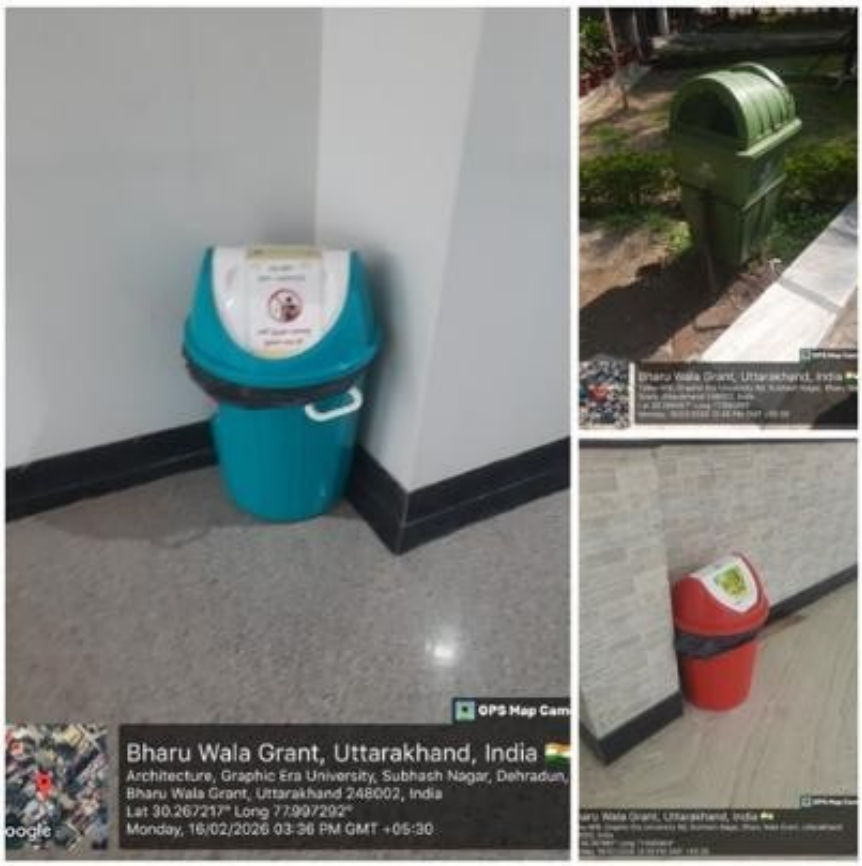


Figure 8-8: Colour Coded Dustbins

8.2.9. Day-light Integration

During the audit phase classrooms, Staff-rooms, computer lab, UPS & batteries room and library areas were surveyed for illumination levels and fresh air-circulation. It was observed most of the rooms are well ventilated and day-light integrated; sample photos are shown in Figure 8-9.

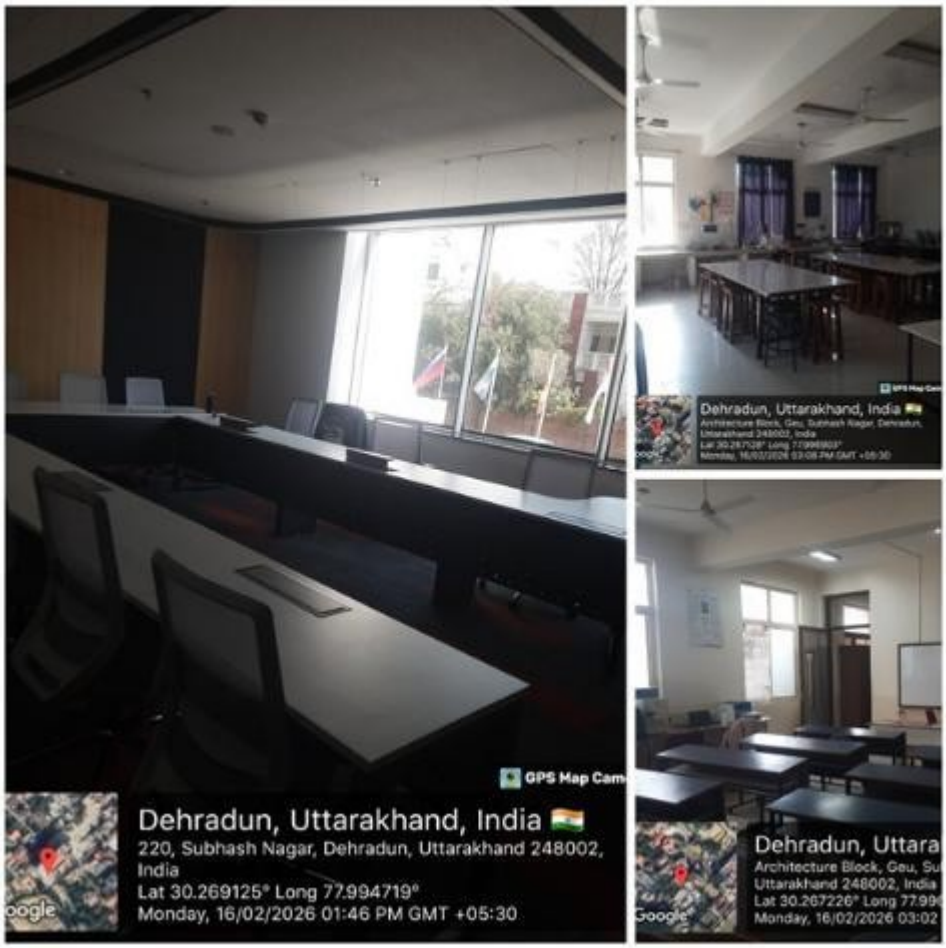


Figure 8-9: Well-ventilated and Day-Light Integrated Classroom and Laboratory

8.2.10. Landscaping with Trees and Plants

Landscaping of the University is worth seeing and reflects aesthetic sense. The University has a canopy of trees and plants to make the environment pollution free to safeguard the health of all the inmates. The trees provide shade and beautiful ambience. Utmost care is taken to develop and maintain green landscaping by trained gardeners and supervisor. The construction and maintenance team constituted in the University looks after the development and maintenance of the greenery in the campus. Photos taken during the audit are shown in Figures 8-11.



Figure 8-10: Greeneries in the Campus

8.2.11. Restricted Entry of Vehicles

The University restricts entry of vehicles inside the campus. Parking area is provided for vehicles to ensure safe movement of peoples within the campus.

The sample image of restriction of vehicles poster is shown in Figure 8-11.



Figure 8-11: Restricted Entry of Vehicles Poster

Maximum and Minium Air Quality Index (AQI) is given in Table 8-2.

Description	Values
Maximum air quality index (AQI)	140
Minimum AQI	80

Table 8-2: Maximum and Minium Air Quality Index (AQI)

Note: This data was shared by University Personnel

8.2.12. Integration of Eco-Friendly Transit Systems

The University has proactively integrated sustainable transport solutions to minimize the environmental impact of daily commuting within the campus. By providing dedicated Bicycles and Electric Vehicle (EV) facilities. The sample images of Electric Vehicle are shown in Figure 8-12.



Figure 8-12: Electric Vehicles for inter campus commute

9. ANNEXURES

9.1. Data Collection Questionnaire

A questionnaire is a checklist used as the primary tool for the collection of data / information in a systematic manner that enables to perform the audit.

9.1.1. General Information of the University

General information of the University needs to be collected to get an overview of the campus for the walk-through purpose. It includes a set of questionnaires as given below.

1. Previous NAAC Grading's:

Previous NAAC Grading's of the University was collected from Table 9-1.

S. No.	Phase	Grade	CGPA/Percentage	Year of Acc.	Acc. Period
1	I				
2	II				
3	III				

Table 9-1: NAAC Grading's Table

2. IQAC Members:

Table 9-2 depicts the format for the collection of Internal Quality Audit team.

S. No.	Name	Designation	Role
1			
2			
3			

Table 9-2: IQAC Members

3. General Information of the University

General information of the University includes an address of University and head office, contact person details, year of establishment etc., as given in Table 9-3.

S. No.	Description	Details	
1.	Name of the University and address:		
1.a	Head office address:		
2.	Telephone/Fax No		
3.	Co-ordinating officer:	Name:	
		Mob:	
		Email:	
4.	Year of Establishment:		
5.	Hostel (Available/Not Available)		
6.	No. of Working days/year		
7.	Brief description of Campus		

Table 9-3: General Information of the University

4. University Infrastructure

Infrastructure details of the University were gathered from Table 9-4.

S. No.	Description	Details
1	Block Name	Class rooms
		Labs
		Staff rooms
		Wash rooms
2		
3		

Table 9-4: Detail Infrastructure of the University

5. Details of Student clubs
6. Details of cells that support students
7. Tentative Schedule of a working day:

a. No. of working days per year:

b. List of holidays:

8. Total area of the campus

9. Details of List of Departments and Courses (Faculty wise)

The total number of department, laboratories, conference hall, Libraries, Auditorium, and Cafeteria are obtained from Table 9-5.

S. No.	Description	Details
1	Department	
2	Laboratories	
3	Conference Hall	
4	Libraries	
5	Auditorium	
6	Cafeteria	

Table 9-5: Details of the Departments

10. Number of staff

Teaching, non-teaching, supporting staff with a male and female breakup is obtained from Table 9-6

S. No.	Teaching Staff		Non-teaching Staff		Support Staff (Security, House Keeping)	
	Male	Female	Male	Female	Male	Female

Table 9-6: Details of the Staff

11. Number of Students

Number of students is collected from Table 9-7.

S. No.	Boys	Girls
1		

Table 9-7: Details of the Students

12. Additional infrastructure details have been collected from Table 9-8.

S. No.	Description	Details	
1.	Number of blocks available for boys hostel	Nos.	
2.	Number of rooms available for boys hostel	Nos.	
3.	Number of blocks available for girls hostel	Nos.	
4.	Number of rooms available for girls hostel	Nos.	
5.	Whether Laundry is available in the hostel	Yes / No	
6.	If Yes List the Electrical Equipment in Laundry Section of the hostel (like Washing machine, Dry Cleaning Machine, Iron)		
7.	Whether gym/ indoor sports hall is available in hostel	Yes / No	
8.	Whether Solar PV based Power Generation is available in campus (academic or hostel block)	Yes / No	
9.	Whether lifts available in academic block	Yes / No	
10.	Whether Kitchen is available in the academic block	Yes / No	
11.	Whether any food counter (outside caterers) available in academic block	Yes / No	
12.	Whether any commercial shops available in academic block	Yes / No	
13.	Any more information or additional details of academic block you would like to share – kindly elaborate here		

Table 9-8: Details of the Departments

9.1.2. Water Audit Details

1. General information

General information required for water management analysis is collected from Table 9-9.

S. No.	Description	Details
1	Source of water	
2	Types of water	
3	No of Wells	
4	No of motors used	
5	No of bore wells	
6	Rating of the motors in HP	
7	Depth of each bore-well	
8	Water level of bore well	
9	Number of water tanks (overhead & underground tanks)	
10	Capacity of overhead tank	
11	Capacity of underground tank	
12	Quantity of water pumped every day	
13	Any water wastage of water /why?	
14	Water usage for gardening	
15	Waste water sources	
16	Use of waste water	
17	Flow of waste water from labs	
18	Whether waste water from labs mixed with ground water?	
19	Any treatment method available for lab water?	
20	Whether any green chemistry method practiced in labs?	
21	Total number of water coolers	
22	Whether Rain water harvesting system available?	
23	Whether Sewage Treatment Plant (STP) is available?	
24	List of equipment installed in STP (If S.No.23 is Yes)	
25	Whether Solar Hot Water System is available in the campus	
26	Number of units and amount of water harvested	

S. No.	Description	Details
27	Any leaky taps in the campus	
28	Amount of water lost per day	
29	Any water management plan used?	
30	Any water-saving techniques followed?	
31	Are there any signs reminding peoples to turn off the water?	
32	No. of water flow meters available	
33	Method of water consumption monitoring	
34	Breakup of daily water consumption	
35	Attach Month wise water bill for last 2 years	
36	Please attach recent water quality test reports for Bore well water, Drinking Water and STP processed water.	
37	What are the sources of hot water	
38	What are the usage areas of hot water	

Table 9-9: Water Management Details

2. STP information

STP details are collected from Table 9-10

S. No.	Description	Details
1.	Number of STP plants installed	
2.	Capacity of STP	
3.	Technology of STP	
4.	Year of Installation	
5.	Schematic / Layout of STP	
6.	Water flow meters installed	
7.	Quantity of Sludge	
8.	Disposal of Sludge	

Table 9-10: Details of STP

3. RO Plant information

RO Plant details are obtained from Table 9-11.

S. No.	Location	Quantity	Capacity
1.			
2.			
3.			

Table 9-11: Details of RO Plant

9.1.3. Energy Consumption Details

1. Energy consumption details:

The energy consumption details required for the audit is collected, the brief format of the same is given in Table 9-12.

S. No.	Type	Units		Value	Cost in Rs.
1	Electricity	kWh	2024		
			2025		
2	LPG	Cylinders			
3	Diesel	Litres (Month wise consumption for the last two years)			
4	Others resources (Please specify)				
5	Total connected load	kW			
6	Contract demand	kVA			
7	Maximum demand recorded	kVA			
8	Average power factor				
9	Energy charges	Rs./kWh			
10	Demand charges	Rs./kVA			
	*** Attach Electricity Bill Copy of last 2 years**				

Table 9-12: Details of Energy Consumption

2. Solar Energy details:

The solar energy details required are collected from Table 9-13.

S. No.	Building No./ Name	Solar water Heater			Solar PV System		
		Capacity	Working / Not working	Year of Installation	Capacity	Working / Not working	Year of Installation

Table 9-13: Details of Solar Energy

3. Solar Street lights details:

a. Quantity -
b. Capacity -
c. Year of Installation –

4. Electrical Equipment details:

Electrical Equipment like transformers DGs UPS Capacitor Bank, AC, Computers, water coolers, fans, exhaust fans are obtained from the Table 9-14.

S. No.	Description	Details	
1.	Number of Transformers Installed	Nos.	
2.	Number of Electrical Panels / Electrical Panel Rooms	Nos.	
3.	Whether Diesel Generator Set Backup Power is Available	Yes / No	
4..	How many number of DG Sets available in the campus (If S.No.3 is Yes)	Nos.	
5.	Whether UPS is available for labs, computers and/or any equipment	Yes / No	
6.	Number of UPS installed with location and capacity (If S.No.5 is Yes)	Nos.	
7.	Whether Capacitor Banks is installed in the electrical panel rooms	Yes / No	
8..	Whether Air Conditioning Units have been installed in the campus	Yes / No	
9.	Type of AC units (split, cassette or packaged) available, capacity and installed location (If S.No.8 is	Nos.	

S. No.	Description	Details	
	Yes)		
10.	Total number of computers available in the campus	Nos.	
11.	Type of computer monitors available (CRT, LCD, LED)	Nos.	
12.	Whether water coolers are installed in the academic blocks	Yes/No	
13.	Type of lamps (Fluorescent Tube Light, CFL, LED, Incandescent, Sodium / Mercury lamps, etc.,) installed in the campus	Nos.	
14.	Type of fans (ceiling, wall mount, standing, exhaust, etc.,) installed in the campus	Nos.	
15.	Whether exhaust fans are installed in hostel / kitchen.(If Yes, share the quantity and installed location)	Yes /No	
16.	Any other electrical equipment's in University buildings.		

Table 9-14: Details of Electrical Equipment

5. List of energy saving initiatives implemented
6. List of energy saving initiatives in plan for future

9.1.4. Waste Management Details

Waste management includes the activities and actions required to manage waste from its inception to its final disposal. The various data/ information required for the assessment of waste management is as collected from the following set of questionnaires.

1. Basic information

Basic information for waste management is collected from Table 9-15.

S. No.	Description	Yes/ No
1	Whether wet and dry garbage segregation is done inside the campus?	
2	Whether garbage is given to external agencies / municipal agencies?	

Table 9-15: Basic Details of Waste Management

2. Types of Waste generated

Types of waste generated in the University are obtained from Table 9-16.

S. No.	Description	Yes / No	Remarks
1	E-Waste (Computers, electrical and electronic parts)		
2	Hazardous / Chemical Waste		
3	Solid Waste (Damaged furniture, paper waste, paper plates)		
4	Dry Leaves		
5	Food Waste		
6	Waste Water (Washing, urinals, bathrooms)		
7	Glass Waste (Broken glass wares from the labs)		
8	Unused Materials		
9	Plastic Waste (Pen, Refill, Plastic water bottles and other plastic containers, wrappers etc.)		

Table 9-16: Types of Waste Generated

3. Segregation of waste

Segregation of waste information at different locations with quantity is gathered from Table 9-17.

S. No.	Location	Bio-degradable	Non-Biodegradable	E-waste	Quantity, kgs/month
1	Office				
2	Labs				
3	Cafeteria / Kitchen				
4	University				

Table 9-17: Segregation of Waste

4. Waste generation management

Waste generation management of the University was collected from Table 9-18

S. No.	Description	Yes / No	Remarks
1	Composting / Vermicomposting		
2	Recycling		
3	Reusing		
4	Other ways		

Table 9-18: Waste Disposal Methods

9.1.5. Green Campus Management Details

1. Total number of plants and trees

The total number of plantations, garden area, and many more are collected as per the set of questionnaires given in Table 9-19

S. No	Description	Details
1	Total number of plant species identified	
2	Total number of plants on the campus	
3	Total number of Trees on the campus	
4	Garden area inside the University –	
5	Total number of medicinal plants /trees on the campus	
6	Total number of vegetables and fruits plantation in the campus	
7	Whether display boards are given to plants and trees for identification	
8	Does Institute celebrate World environment day?	
9	Does Institute celebrate World water day?	
10	Does Institute celebrate World ozone day?	
11	Does Institute celebrate World Earth day?	
12	Total number of aquatic water plants	

Table 9-19: List of Plantation Details

2. List of plants/ trees

List of plants/ trees with their scientific names obtained from Table 9-20.

S. No.	Common/Local Name	Scientific name	No. of Trees/Plants

Table 9-20: List of Plants/Trees in Campus

9.1.6. Carbon Footprint Management Details

The carbon emission from various activities such as transport, diesel generator usage, LPG consumption, and electricity consumption were collected, as per Table 9-21.

S. No	Description	Details
1	Whether University provides transport facility for staff and students (Yes/No)	
2	Number (or Percentage) of staff using transport services provided by University	
3	Number (or Percentage) of students using transport services provided by University	
4	Number (or Percentage) of Staff using public transport	
5	Number (or Percentage) of Staff using Bike	
6	Number (or Percentage) of Staff using Car	
7	Number (or Percentage) of students using Public transport	
8	Number (or Percentage) of students using Car	
9	Number (or Percentage) of students using Bike	
10	Number (or Percentage) of students using Bicycles	
11	Average consumption of diesel per month	
12	Average electricity consumption per month	
13	Average LPG consumption per month	

Table 9-21: Details of Carbon Footprint Management

9.1.7. Photos Required for Audit

1. General Photos

In various sections, different types of photos are required to validate the existence of things, and hence they are collected from Table 9-22.

S. No	Description	Details
1	Photos of student's NSS activities	
2	Photos of Safety policy	
3	Photos of the training program on the use of fire extinguishers	
4	Photos of environmental policies adopted by University	
5	Photos of MoUs for Waste management	

6	Photos of any other policies adopted by University		
7	Photos of water test report	Drinking Water	
		STP processed water	
		Bore-well water	
		Other water Sources (Like Tanker water and any other)	
8	Photos of use of Energy efficient devices like fan, bulbs etc.		
9	Photos of LCD/LED monitors used in Labs		
10	Photos of dry and wet waste collection bins		
11	Photos of celebrating World Environment Day		
12	Photos of celebrating World Water Day		
13	Photos of celebrating World Earth Day		
14	Photos of celebrating World Ozone Day		

Table 9-22: List of Photos