QUALITY AUDIT REPORT

ON

WATER AUDIT, ENERGY AUDIT,

WASTE MANAGEMENT AUDIT,

GREEN CAMPUS MANAGEMENT AUDIT

AND ENVIRONMENT AUDIT

OF

INTERNATIONAL SCHOOL OF MANAGEMENT EXCELLENCE (ISME)

SY. NO. 88, CHEMBANAHALLI, NEAR DOMMASANDRA CIRCLE,

SARJAPUR ROAD, BANGALORE 562125

2022 – 2023

ISME

ECO ENERGIME ENGINEERS LLP

ENHANCING RESOURCE EFFICIENCY

QUALITY AUDIT REPORT

OF

INTERNATIONAL SCHOOL OF MANAGEMENT EXCELLENCE (ISME)

SARJAPUR ROAD, BANGALORE 562125

2022 – 2023

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 Akhilesh

PROJECT ADVISOR

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

ACKNOWLEDGEMENTS

We are thankful to the management of **International School of Management Excellence (ISME), Bangalore** 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 college. They took key interest and gave valuable inputs during the course of study. We would like to thank:

Director – International School of Management Excellence (ISME), Bangalore

And other Staff in personnel who have given full co-operation and support. They took a keen interest and gave valuable inputs during the course of study.

Certificate

This is to certify that M/s. Eco Energime Engineers LLP, Bengaluru has conducted **Quality Audit** of **"International School of Management Excellence (ISME), Bangalore"** for the academic year 2022 – 2023. The Audit includes water audit, energy audit, waste management audit, green campus management audit and aspects of environment audit.

The audit involves field visit, measurements and 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

EEELLP ACKNOWLEDGEMENT

EEELLP team thanks the management of **"International School of Management Excellence (ISME), Bangalore"** 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 Director & 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

DISCLAIMER

The Audit Team has prepared this report for International School of Management Excellence (ISME), Bangalore based on the input data submitted by the representatives of college complemented with the best judgment capacity of the expert team.

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

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

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

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ABBREVIATION AND ACRONYMS

1.	A	:	Amperes
2.	DG	:	Diesel Generators
3.	E-Waste	:	Electronic Waste
4.	etc.	:	Etcetera
5.	FTL	:	Fluorescent Tube Light
6.	GHG	:	Green House Gas
7.	Hz	:	Hertz
8.	HP	:	Horse Power
9.	HT	:	High Tension
10.	I	:	Current
11.	ICT	:	Information and Communications Technology
12.	kL	:	Kilo Liters
13.	kV	:	kilo volt
14.	kVA	:	kilo volt ampere
15.	kW	:	Kilo Watt
16.	kWh	:	kilo Watt hour
17.	kWp	:	kilo Watt peak
18.	LCD	:	Liquid Crystal Display
19.	LED	:	Light Emitting Diode
20.	MoU	:	Memorandum of Understanding
21.	NA	:	Not Applicable
22.	NAAC	:	National Assessment and Accreditation Council
23.	Nos.	:	Numbers
24.	NSS	:	National Service Scheme
25.	Rs.	:	Rupees
26.	RR. No.	:	Revenue Register Number.
27.	S. No.	:	Serial Number
28.	Sq. Ft.	:	Square Feet
29.	Sq.m.	:	Square Meter
30.	SRTPV	:	Solar Roof Top Photo Voltaic
31.	TL	:	Tube Light
32.	TR	:	Ton of Refrigeratio
33.	UG	:	Under Graduate
34.	V	:	Volts
35.	W	:	Watts
36.	Wi-Fi	:	Wireless Fidelity
37.	Wp	:	Watt peak
38.	#	:	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 college helps to increase the awareness levels of stakeholders, staffs and students, to understand its advantages towards impact on sustainable future.

The International School of Management Excellence (ISME), Bangalore is very **well maintained, clean and neat**, which emphasis the resource allocation (man power, 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 sewage treatment plant (STP) and solar hot water systems is **noteworthy**. Besides, environmental awareness programmes initiated by the management and administration shows 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 room. It was observed that Illumination and Ventilation is **adequate** considering natural light and fresh air circulation.

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

Institutional Initiatives

- Push type taps for water conservation
- Day light integration in class rooms, staff rooms, hostels and common areas
- Use of LED lights
- Use of heat pumps for hot water generation
- Use of Solar water heater for hot water generation
- Use of LED/ LCD monitors
- Sanitary napkin incinerator
- Bins for waste collection
- Campaign on Plastic free campus
- Green landscaping
- Regular maintenance of greeneries

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

1. INTRODUCTION

International School of Management Excellence (ISME) is a leading Business School offering world class education through a student focused culture of excellence, international outlook, entrepreneurial thinking, and industry alignment. ISME was founded in 2006 by alumni from Carnegie Mellon University, Purdue University and Wharton Business School, USA. Many ISME faculty have international professional experience or are alumni of top colleges from India and abroad. ISME has graduated over 1900 students who are working in top multi-nationals in India and abroad.

ISME is part of The NVT Group, which is a well-established conglomerate with a diverse portfolio of institutions that have significantly contributed to various technology, defence, education and real estate sectors.

Founders

The group companies have been founded and led by Mr. KG Garg (BE, ME Indian Institute of Technology, Roorkee); Dr. Nitin Garg (B Tech & M Tech IIT Bombay; MBA, Carnegie Mellon University; PhD IIM Lucknow); Vivek Garg (MBA Purdue University; BE NIT Allahabad; (PhD) ISB); Tanuj Garg (MS Carnegie Mellon University; MBA, Wharton Business School, USA)

About NVT Group

The group's journey began in 1994 with the establishment of NVT Quality Certification (NVTQC: nvtquality.com), which has become a reputable and acknowledged name in quality assurance and certification in sectors of Aerospace, Defence, Space and export-oriented industries. In 2004, the group expanded its scope and influence by establishing NVT Quality Educational Trust (NVTQET). Under the umbrella of NVTQET, the International School of Management Excellence (ISME: isme.edu.in) was set up in Bangalore in 2006, emerging as a premier business school in India. In 2017, the NVT Group set up two prominent educational institutions were established – National Public School Whitefield (npswhitefield.com) and National Public School East (npseast.com). In 2022, the third school, National Public School Marathahalli has been established. The educational institutions of NVT Group have over 3500 students. The group also has a real estate vertical focused on large high end luxury villa community developments. NVT Group focusses on providing education to children of migrant labor as part of its CSR initiative.

International School of Management Excellence, Bangalore was established in Bangalore in the year 2006. The institution began its PGDM course in 2006 in Whitefield, Bangalore. In 2013 the institution moved to its current location in Chembanahalli, Sarjapur Road.

ISME is in the IT and start-up hub of India giving the students ample avenues with respect to employment opportunities.

The BBA course affiliated to Bangalore University began in 2017 and the B.Com course began in 2020. The Institution has BBA, BCom and BCA courses affiliated to Bangalore University.

As the undergraduate course at ISME is affiliated to Bangalore University, the institution follows the curriculum prescribed by the University. The institution enriches this curriculum with various practical activities and extracurricular and co-curricular activities. The curriculum is delivered through a closely monitored in-house delivery method. The teaching-learning process uses ICT based teaching methods.

VISION

"To be a business school of international repute"

MISSION

Our Mission is to transform every student to become a Successful business professional with a global outlook through:

- Imparting quality education by outstanding business leaders and academicians
- Providing a culture of excellence, entrepreneurial thinking, social responsibility and industry alignment

Committee and Cells

The following committees and cells are available in the college:

- Governing Body
- Infrastructure and Finance Committee
- Academic and Examination Administration
- Curriculum Development Committee
- Internal Complaints Committee (Anti-Sexual Harassment and Women Grievance Redressal)
- Anti-Ragging
- SC/ST and Minority/OBC Committee
- Internal Quality Assurance Committee (IQAC)
- Admissions Committee
- Research Committee
- Department Student Grievance Redressal Committee

Facilities available for physical wellness

The management has provided playground for sports activities. Pictures of the playground are given in figure 1.1. and indoor games is shown in figure 1.2.

Figure1-1: Playground

Figure 1-2: Indoor games

Overview of Quality Audit:

Quality Audit helps college / facility 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. During the meeting, introduction of team members, scope and objectives of the audit were discussed.

Management Commitment

The Management of the college 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.

College administration is vital to the process of realizing campus sustainability, and college 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 action in campus greening. Existing data will allow the college 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 focused initially on educating colleges and universities 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's 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 college 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 MoU
- 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 document, purchase document, were reviewed and relevant data and inputs required for analysis have been collected.

3.2.2. Review of Policies

College has various policies that include safety 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. The fire extinguishers are shown in figure 3.1. The fire hydrant equipment are shown in figure 3.2.

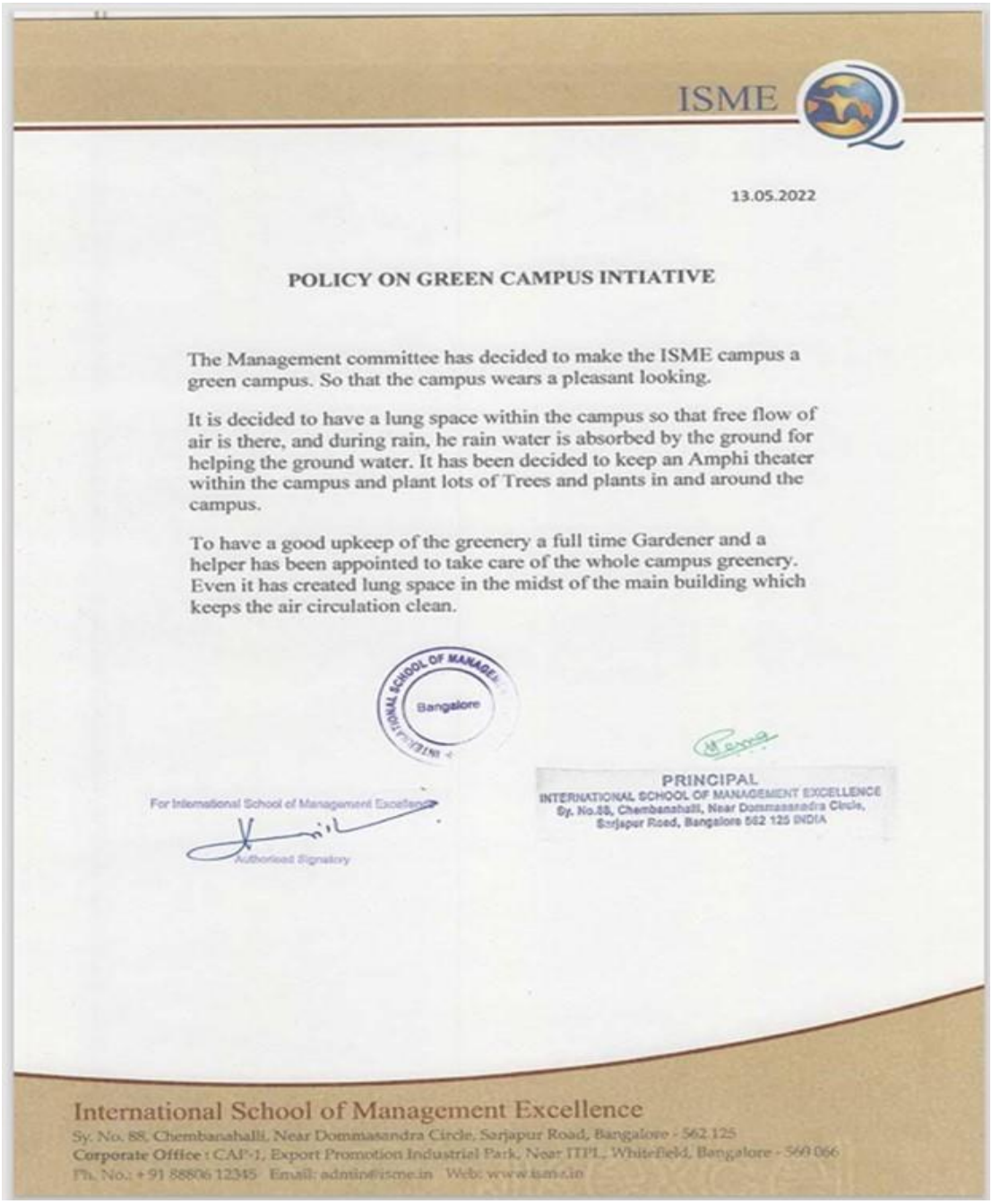
Figure 3-1: Fire Extinguisher installed in the floors

Figure 3-2: Fire hydrant system

B. Green Initiatives Policy:

The management, staffs and students are committed to implement and follow the green initiatives in the college premises.

Moreover, institution is committed to continual improvement and compliance to existing statutory and regulatory requirements. The green policy document available in the college is shown in figure 3-3.



ISME

13.05.2022

POLICY ON GREEN CAMPUS INTIATIVE

The Management committee has decided to make the ISME campus a green campus. So that the campus wears a pleasant looking.

It is decided to have a lung space within the campus so that free flow of air is there, and during rain, he rain water is absorbed by the ground for helping the ground water. It has been decided to keep an Amphi theater within the campus and plant lots of Trees and plants in and around the campus.

To have a good upkeep of the greenery a full time Gardener and a helper has been appointed to take care of the whole campus greenery. Even it has created lung space in the midst of the main building which keeps the air circulation clean.

INTERNATIONAL SCHOOL OF MANAGEMENT EXCELLENCE Bangalore

For International School of Management Excellence

Authorised Signatory

PRINCIPAL
INTERNATIONAL SCHOOL OF MANAGEMENT EXCELLENCE
Sy. No.88, Chembanahalli, Near Dommasandra Circle,
Sarjapur Road, Bangalore 562 125 INDIA

International School of Management Excellence
Sy. No. 88, Chembanahalli, Near Dommasandra Circle, Sarjapur Road, Bangalore - 562 125
Corporate Office : CAP-1, Export Promotion Industrial Park, Near ITPL, Whitefield, Bangalore - 560 066
Ph. No.: +91 88806 12345 Email: admin@isme.in Web: www.isme.in

Figure 3-3: Green Initiatives Policy

3.2.3. Review of various measures implemented

During the Green Audit study, it was observed the college has taken various initiatives in conserving natural resources that include:

- Push type taps for water conservation
- Day light integration in class rooms, staff rooms, hostels and common areas
- Use of LED lights
- Use of heat pumps for hot water generation
- Use of Solar water heater for hot water generation
- Use of LED/ LCD monitors
- Sanitary napkin incinerator
- Bins for waste collection
- Campaign on Plastic free campus
- Green landscaping
- Regular maintenance of greeneries

3.2.4. Site Walk through

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

College Infrastructure

College 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:

- Sports and Games
- Cafeteria
- Auditorium
- Smart Class room
- Conference Rooms
- Meeting Room
- Transport
- Hostel
- 24/7 Security
- Library
- Staff Room

All the classrooms and staff rooms are well ventilated and the integration of day-light is well utilized. This has helped in optimized 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 college staff (Principal, teaching staff, non-teaching staff) and students. The consolidated information from the interviews is given in the following sub-sections.

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.

Borewell is the only source of water available, for facilitating the water supply requirement of the entire campus. Two number of borewells are available. The location and name of the borewells are given in table 4-1.

S. No.	Location	Name
1	Near Entrance	Borewell 1
2	Near STP area	Borewell 2

Table 4-1: Details of Borewell

The image of borewell is shown in figure 4-1.

Figure 4-1: Borewell

The water from borewell supply is received in sumps. The details of sump location, name, capacity and source of water is given in table 4-2.

S. No.	Location	Capacity, kL	Source of water
1	Beside Hostel	100	Borwell
2	Beside Hostel	100	Borewell

Table 4-2: Details of sumps

Figure 4-2: Sumps in Campus

From the sumps the water is pumped to overhead tanks using electrical motor pump.

The details of list of tanks installed in various blocks with capacity, type of tank and installed location are given in table 4.3.

S. No.	Location	Tank
2	College block	PVC – OHT – 5 kL – 1 No.
3	Girls hostel	PVC – OHT – 5 kL – 1 No.
4	Girls hostel	PVC – OHT – 5 kL – 1 No.
5	Girls hostel	PVC – OHT – 3 kL – 1 No.
6	Boys hostel	PVC – OHT – 5 kL – 1 No.
7	Boys hostel	PVC – OHT – 3 kL – 2 No.

Table 4-3: Details of tanks

The image of the overhead tanks is shown in figure 4-3.

Figure 4-3: PVC Overhead tanks installed at the terrace

Water level controller is installed to control water pumping from sump to overhead tanks. The image of the water level controller is shown in figure 4-4.

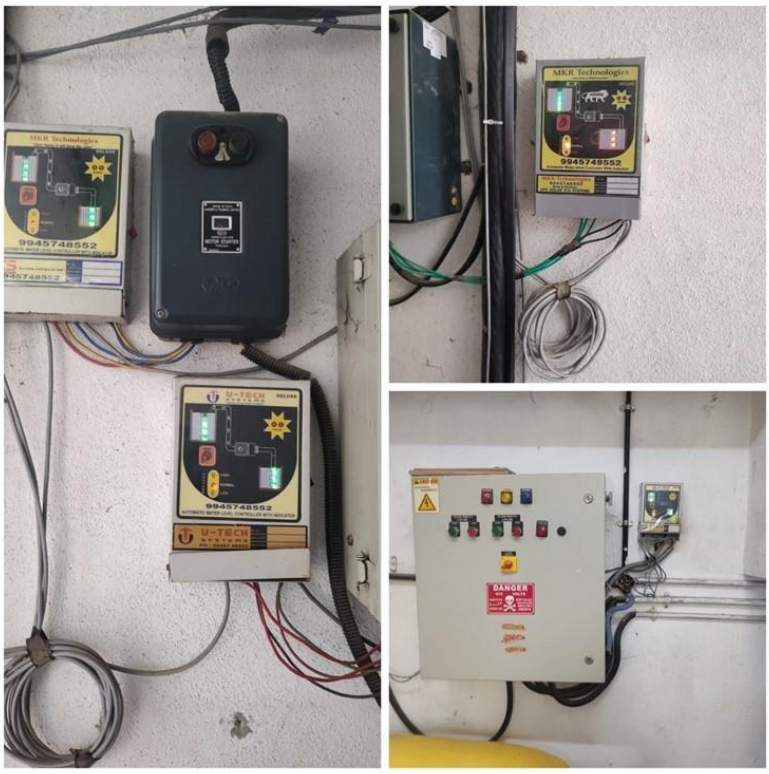


Figure 4-4: Water level controller for Basement to overhead tank water pumping

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

- Raw Water
- Drinking Water
- Hot 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

The raw water is consumed in the following areas:

- Kitchen
- Hostel
- Washrooms
- Cleaning
- Laboratories
- Garden

4.1.2. Drinking Water System

The raw water from the over-head tank in terrace is received to the water purifiers installed in each floor. From these water purifier, the drinking water is supplied.

Water purifier and dispensers are available in all floors to provide drinking water. The drinking water dispenser available in college for drinking purposes is shown in figure 4-5.

Figure 4-5: Drinking water dispenser available in floors

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 and heat pump installed in the hostel terrace.

The pictures of heat pump and solar water heater installed in the hostel are given in figure 4-6.

Figure 4-6: Heat pump and solar water heater installed in the college

4.2. Institutional Initiatives for Water Conservation

4.2.1. Installation of water flow meters

Water is pumped from the borewells and distributed through overhead tanks available in terrace. With the presence of flow meters, it is possible to measure quantity of water used per day. Water flow meter installed in borewell to quantify overall water consumption. The picture of water flow meter installed in the college is shown in figure 4.7.

Figure 4-7: Water flow meter

4.2.2. Sewage Treatment Plant

The procedure for removing contaminants from the wastewater basically from the household sewage is called sewage treatment. It has to undergo the chemical, physical and biological procedure to remove these contaminants and give out an environmentally safe treated effluent. A semi-solid slurry called the sewage sludge is the by-product of the sewage treatment. This sludge is further processed before it is suitable for land application.

The institution has installed STP. The STP is shown in figure 4-8.

Figure 4-8: STP Area

4.2.3. Ground Water Recharge

Rainwater harvesting is the simple process or technology used to conserve rainwater by collecting, conveying, purifying, storing and utilizing. The process of recharging the ground water by utilizing rain water harvested, is practiced by ground water recharge pits.

The picture of ground water recharge pit is shown in figure 4-9.

Figure 4-9: Ground water recharge pit

4.2.4. 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 push type tap used in the college is shown in figure 4-10.

Figure 4-10: Sample photo of push type tap in the wash rooms

4.2.5. Regular maintenance of water distribution system

In order to create awareness regarding water conservation, sign boards / posters indicating save water, conserve water were made available at appropriate locations like handwash area, drinking water tap points.

The sample bill for plumbing material purchase bill is shown in figure 4-11.

Tax Invoice (ORIGINAL FOR RECIPIENT)

Nandi Marketing Corporation [BILLING] 21-22
#10, Dispensary Road,(N.C. Road)
Bangalore-56000/1.
Contact No:080-25582533/9886925929/9448135009
GSTIN/UIN: 29ABBPV6568J1ZV
State Name : Karnataka, Code : 29
E-Mail : nandi_mrktcorp@rediffmail.com

Buyer
NVT Quality Educational Turst
CAP1, EPIP, Whitefiled, Near ITPL,
Bangalore-560066
State Name : Karnataka, Code : 29

Invoice No. 17443/22-23	Dated 13-Jul-2022
Delivery Note	Mode/Terms of Payment CREDIT
Supplier's Ref.	Other Reference(s)
Buyer's Order No. PO-2022-070036	Dated 8-Jul-2022
Despatch Document No.	Delivery Note Date
Despatched through	Destination

Terms of Delivery
Delivery @
Sy. No. 88, Chembanahalli,
Near Dommasandra Circle,
Bangalore-562125
Mr. Bhaskar- 9591124747

Sl No	Description of Goods	HSN/SAC	Quantity	Rate	per	Disc. %	Amount
1	F8060401 BOTTLE TRAP 300 MM(CM1048)	7418	5 nos	1,119.00	nos		5,595.00
2	Urinal Waste Coupling	7418	11 nos	330.00	nos		3,630.00
3	F8050101 WASTE COUPLING FULL THREAD(CM103)	7418	16 nos	315.00	nos		5,040.00
4	F9020101 PILLAR COCK PRESSMATIC (CG601)	8481	15 nos	1,461.00	nos		21,915.00
5	F2013101 Fountain Pillar Cock	8481	3 nos	980.00	nos		2,940.00
							39,120.00
	Transport						1,000.00
	CGST						3,610.79
	SGST						3,610.79
	Round Off						0.42
	Total		50 nos				₹ 47,342.00

Amount Chargeable (in words)
Indian Rupees Forty Seven Thousand Three Hundred Forty Two Only
E & O.E

HSN/SAC	Taxable Value	Central Tax Rate	Central Tax Amount	State Tax Rate	State Tax Amount	Total Tax Amount
7418	14,629.64	9%	1,316.66	9%	1,316.66	2,633.32
8481	25,490.36	9%	2,294.13	9%	2,294.13	4,588.26
Total	40,120.00		3,610.79		3,610.79	7,221.58

Tax Amount (in words) : Indian Rupees Seven Thousand Two Hundred Twenty One and Fifty Eight paise Only

Company's PAN : ABBPV6568J

Declaration
1.Goods once sold will not to be taken back or exchanged 2. Interest @24% p.a will be charged for bill remaining unpaid above 30days. 3.Our responsibility ceases once the goods leaves our stores 4.cheques returns will attract a penalty of Rs.300/-per instrument

Company's Bank Details
Bank Name : State Bank of India
A/c No. : 51021160381
Branch & IFS Code : SIVAN CHETTY GARDEN & SBIN0031626

for Nandi Marketing Corporation [BILLING] 21-22
Authorised Signatory

This is a Computer Generated Invoice

Figure 4-11: Awareness posters on water conservation

4.2.6. Awareness posters on water conservation

In order to create awareness regarding water conservation, sign boards / posters indicating save water, conserve water were made available at appropriate locations like handwash 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

The college receives power supply from the state electricity board (BESCOM – Bangalore Electricity Supply Company Limited) at HT 11 kV. The 11kV rated HT power supply is stepped down to LT 433V, by one number of 315 kVA rated transformer. The facility has availed power supply, with connection – RR. No ATBHT-132 with HT-2(C)-(i) tariff. Transformer unit installed inside college premises is as 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	315
2	Rated Voltage Prim/Sec	kV	11/0.433
3	Rated Current Prim/Sec	A	5.25/420
4	Type of Cooling	-	ONAN
5	Frequency	Hz	50
6	Impedance	-	4.64%
7	Phase	-	3
8	Make	-	Kiran Power

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 is distributed to the various distribuition 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:

One numbers of DG (Diesel Generator) set is used for backup power supply, during power failure from BESCOM. The DG sets are operated in manual mode. DG sets installed at the college premises is shown in the figure 5-3.

Figure 5-3: Diesel Generator (DG) sets

The name plate details of the DG sets are shown in the table 5-2.

S. No	Description	Unit	DG #1
1	Rated Capacity	kVA	140
2	AC Volt	V	415
3	AC Amp	A	340
4	Power Factor		0.8
5	Phase		3
6	Ambient	°C	40
7	Frequency	Hz	50
8	RPM		1500
9	Make		Powerica

Table 5-2: DG Set -Specifications

5.1.1. Tariff Structure

The sanctioned contract demand of the campus is 80 kVA at specified voltage of 11 kV. Electricity supply from BESCOM is billed under HT-2(C)-(i) schedule of tariffs. The tariff includes demand charges of Rs. 240 per kVA, and energy charges of Rs.7.20 per kWh.

The kVA demand charges @ Rs. 240/kVA of maximum demand recorded during the month or 85% of the contract demand, whichever is higher

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	80
2	Demand Charges	Rs./kVA	240
3	Maximum Demand Recorded during last one year	kVA	65
4	Average Monthly Energy Consumption during last one year	kWh	20400
5	Average System Power Factor		0.9
6	Average Energy Charges considered for savings calculations	Rs./ kWh	7.20

Table 5-3: Electricity Bill Parameters

Figure 5-4 indicates the month wise recorded maximum demand and month wise energy consumption of the college campus for the last one year (Mar 2022 to Feb 2023).

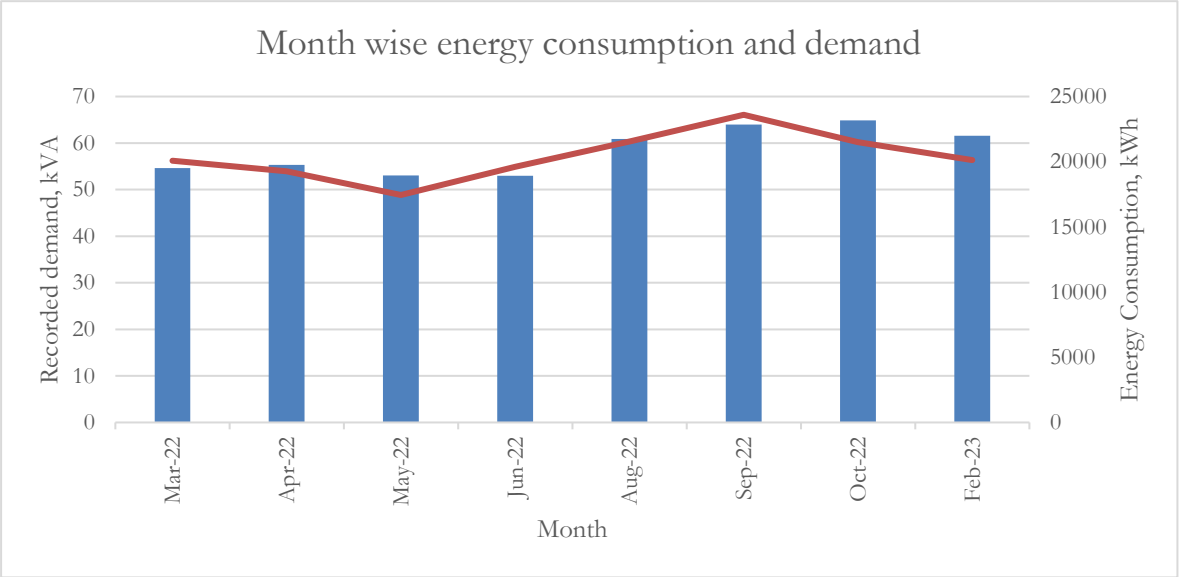


Figure 5-4: Month wise Maximum Demand and Energy Consumption

From the maximum demand curve, it was observed that maximum demand registered during the month of Oct 2022 was found to be 65 kVA and is the peak demand during the last one year of billing period. Average of registered maximum demand during April 2022 to March 2023 is 58 kVA.

From the month wise energy consumption profile, it was observed maximum energy consumption was registered during Sep 2022. Average monthly energy consumption is 20,400 kWh.

5.2. Institutional Initiatives for Energy Conservation

During the study, observations were carried out on the usage of the inventories in the college building premises. In the intension of saving the electricity, various measures have been adopted in the college. 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 college premises (class rooms, labs, staff rooms, office rooms, library and auditoriums).

5.2.1. Day-light Integration

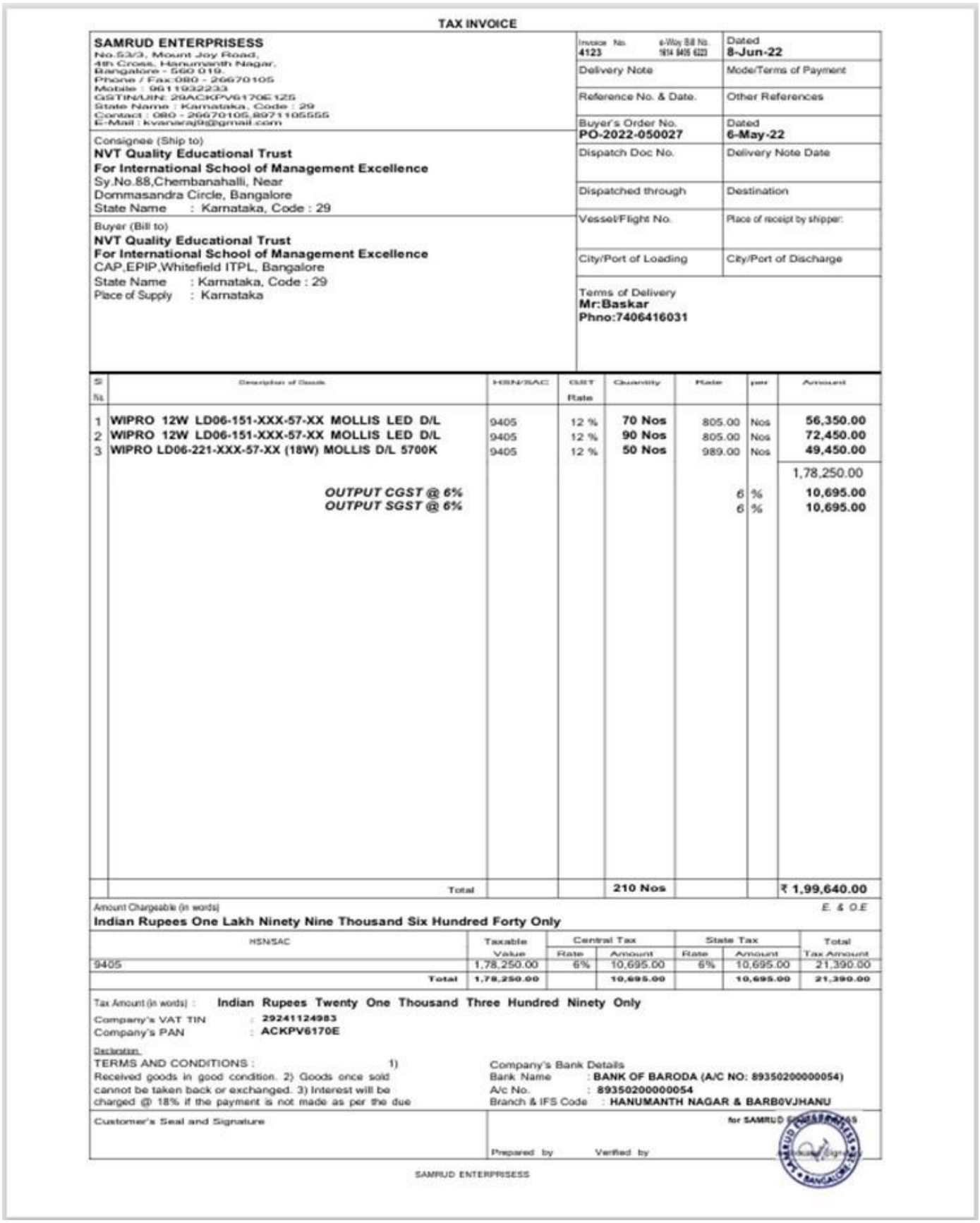
During the audit phase classrooms, Staff-rooms, computer lab, and library areas were surveyed for illumination levels and fresh air-circulation. It was observed most of the rooms are well ventilated and day-light integrated; sample photos are shown in figure 5-5.

Figure 5-5: Well-ventilated and day-light integrated class room and Library

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, hostel, dining area, etc. Sample photo of LED lamp used in the some of the locations of the college area are shown in figure 5-6 and sample LED purchase bill is shown in figure 5-7.

Figure 5-6: LED lights installed in Campus



TAX INVOICE

SAMRUD ENTERPRISESS
No.53/3, Mount Joy Road,
4th Cross, Hanumanth Nagar,
Bangalore - 560 019.
Phone / Fax:080 - 26670105
Mobile : 9611932233
GSTIN/UIN: 29ACKPV6170E1Z5
State Name : Karnataka, Code : 29
Contact : 080 - 26670105,8971105555
E-Mail : kvanaraj9@gmail.com

Invoice No. 4123 / e-Way Bill No. 1614 9405 6223	Dated 8-Jun-22
Delivery Note	Mode/Terms of Payment
Reference No. & Date.	Other References
Buyer's Order No. PO-2022-050027	Dated 6-May-22
Dispatch Doc No.	Delivery Note Date
Dispatched through	Destination
Vessel/Flight No.	Place of receipt by shipper:
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)
NVT Quality Educational Trust
For International School of Management Excellence
Sy.No.88,Chembanahalli, Near
Dommasandra Circle, Bangalore
State Name : Karnataka, Code : 29

Buyer (Bill to)
NVT Quality Educational Trust
For International School of Management Excellence
CAP,EPIP,Whitefield ITPL, Bangalore
State Name : Karnataka, Code : 29
Place of Supply : Karnataka

Terms of Delivery
Mr:Baskar
Phno:7406416031

Sl No.	Description of Goods	HSN/SAC	GST Rate	Quantity	Rate	per	Amount
1	**WIPRO 12W LD06-151-XXX-57-XX MOLLIS LED D/L**	9405	12 %	**70 Nos**	805.00	Nos	**56,350.00**
2	**WIPRO 12W LD06-151-XXX-57-XX MOLLIS LED D/L**	9405	12 %	**90 Nos**	805.00	Nos	**72,450.00**
3	**WIPRO LD06-221-XXX-57-XX (18W) MOLLIS D/L 5700K**	9405	12 %	**50 Nos**	989.00	Nos	**49,450.00**
							1,78,250.00
	OUTPUT CGST @ 6%				6	%	**10,695.00**
	OUTPUT SGST @ 6%				6	%	**10,695.00**
	Total			**210 Nos**			**₹ 1,99,640.00**

Amount Chargeable (in words) E. & O.E
Indian Rupees One Lakh Ninety Nine Thousand Six Hundred Forty Only

HSN/SAC	Taxable Value	Central Tax Rate	Central Tax Amount	State Tax Rate	State Tax Amount	Total Tax Amount
9405	1,78,250.00	6%	10,695.00	6%	10,695.00	21,390.00
Total	**1,78,250.00**		**10,695.00**		**10,695.00**	**21,390.00**

Tax Amount (in words) : **Indian Rupees Twenty One Thousand Three Hundred Ninety Only**
Company's VAT TIN : **29241124983**
Company's PAN : **ACKPV6170E**

Declaration
TERMS AND CONDITIONS : 1) Received goods in good condition. 2) Goods once sold cannot be taken back or exchanged. 3) Interest will be charged @ 18% if the payment is not made as per the due

Company's Bank Details
Bank Name : **BANK OF BARODA (A/C NO: 89350200000054)**
A/c No. : **89350200000054**
Branch & IFS Code : **HANUMANTH NAGAR & BARB0VJHANU**

Customer's Seal and Signature

for SAMRUD ENTERPRISESS

Prepared by Verified by

SAMRUD ENTERPRISESS

Figure 5-7: LED lights purchase bill

5.2.3. Installation of Heat Pump

Heat pump technology has been used for the hot water purpose in hostel and is integrated with the solar water heater. The integrated hot water system is shown in figure 5-8.

Figure 5-8: Integrated recirculation type -Hot water system

5.2.4. Installation of Solar Water Heater

Solar water heaters are installed in hostel terrace for generating hot water. It is integrated with heat pump system. Sample photo of solar water heater used in the campus are shown in figure 5-9.

Figure 5-9: Use of Solar Water Heater

The cost savings by installation of solar water heater are given in table 5-4.

S. No.	Description	Unit	Values
1	Solar water heater installed	L	3000
2	Total amount of heat produced	kCal/hr	90000
3	Electricity equivalent	kWh	104.7
4	No. of working days per year	days	250.0
5	Annual electricity savings	kWh	26162.8
6	Average electricity cost	Rs./kWh	8.25
7	Annual cost savings achieved per year	Rs. lakh/year	2.2
8	CO2 mitigations per year	Tons/year	22.2

Table 5-4: Annual cost savings by installation of Solar Water Heater

5.2.5. Installation of UPS for power backup

UPS (Un-interrupted Power Supply) system is installed in the college premises for power backup. Six numbers of UPS (3 kVA, 5 kVA, 10 kVA, 11 kVA, 20 kVA and 25 kVA rated each one number), have been installed to provide backup power supply, during power failure from grid. The picture of UPS and battery installed in the college is shown in figure 5-10.

Figure 5-10: UPS and batteries

5.2.6. 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 5-11.

Figure 5-11: Use of LED monitors in the computer labs

5.2.7. Use of Electrical Safety Mats

Electrical safety mats were used placed near each electrical panel to avoid electrical shock risk. The image of the electrical safety mats used is shown in figure 5-12.

Figure 5-12: Electrical safety mats near electrical panel

5.2.8. Awareness posters on Energy conservation

Sign boards on energy conservation are kept in the campus to create awareness among the staff and students to conserve electricity. Posters stating - 'Save Energy', 'Switch off light and fan when not in use' were placed at the college.

The sample images of awareness poster on energy conservation is shown in figure 5-13.

Figure 5-13: Awareness posters on Energy conservation

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 college 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	External Agency
4	Dry Leaves	Yes	Municipal Collection
5	Food Waste	Yes	Municipal Collection
6	Waste Water	Yes	STP
7	Glass Waste	No	NA
8	Unused Materials	No	NA
10	Plastic Waste	Yes	Municipal Collection

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

6.1.1. TYPES OF WASTE

WET WASTE: Wet waste is all the kitchen waste that we produce. These are the waste which is collected on a daily basis 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.

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 is 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 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, aluminum roofing sheets, and other metallic things etc.

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 produced in the college, which is produced from kitchens of canteens in the campus, from the remains of the tiffin boxes brought by the students, teachers, & staff of the college, separate bins were placed. These wet wastes are collected and disposed through municipal collection agency.

6.1.4. Bio- Waste Management

As part of maintaining hygienic environment for the girl's, the management has provided the sanitary napkin dispenser and sanitary napkin incinerator in the girl's toilet.

6.2. Institutional Initiatives for Waste management

6.2.1. Dust Collection Bins

Dust collection bins are placed at the college premises. The dust collection bins are used to make the segregation easier.

The sample image of dust collection bins is shown in figure 6-1.

Figure 6-1: Dust collection bins

6.2.2. Regular cleaning of campus

Regular cleaning of campus is done to maintain overall hygiene. Cleaning activities are carried out using water and floor cleaning chemicals in bucket and mop. Mopping is done every day.

The sample image of cleaning activity using bucket and mop is shown in figure 6-2.

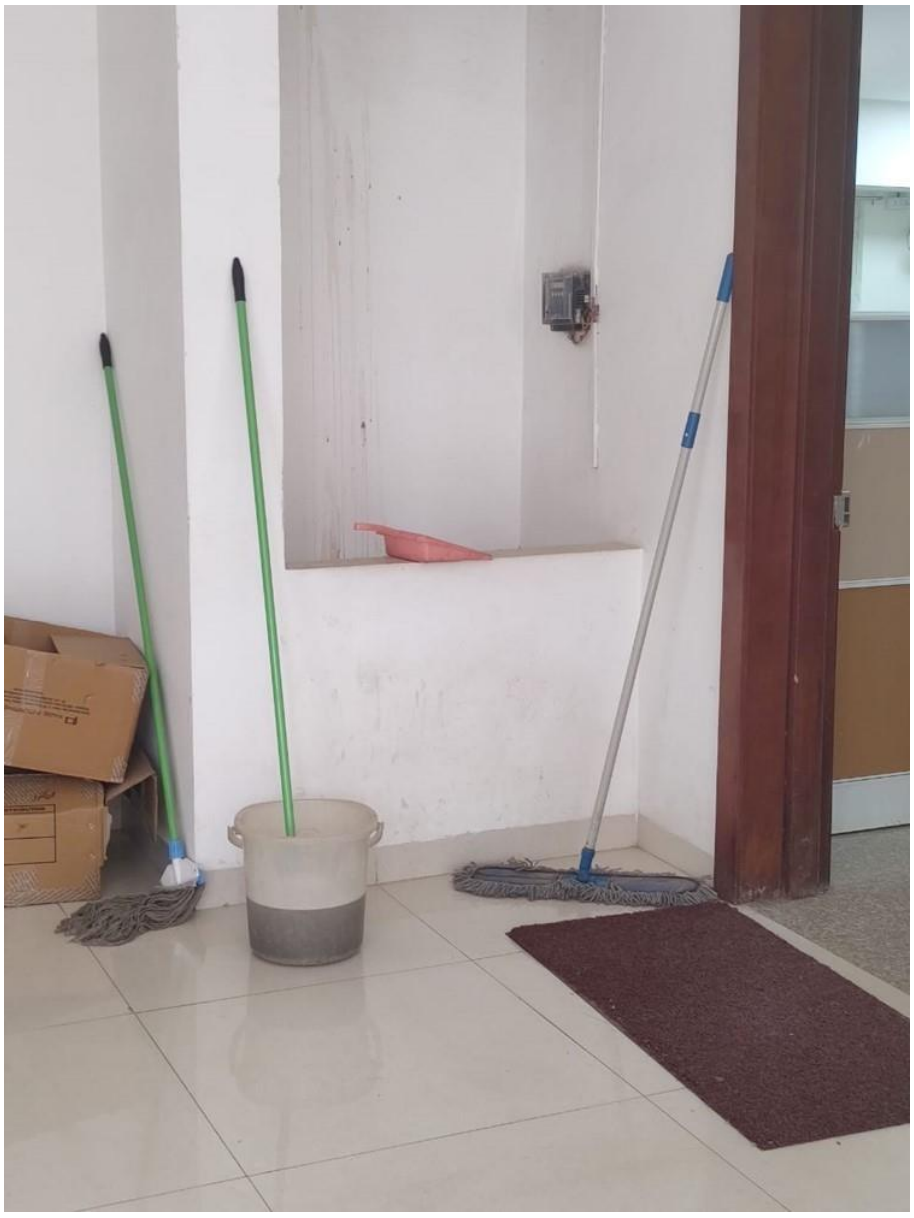
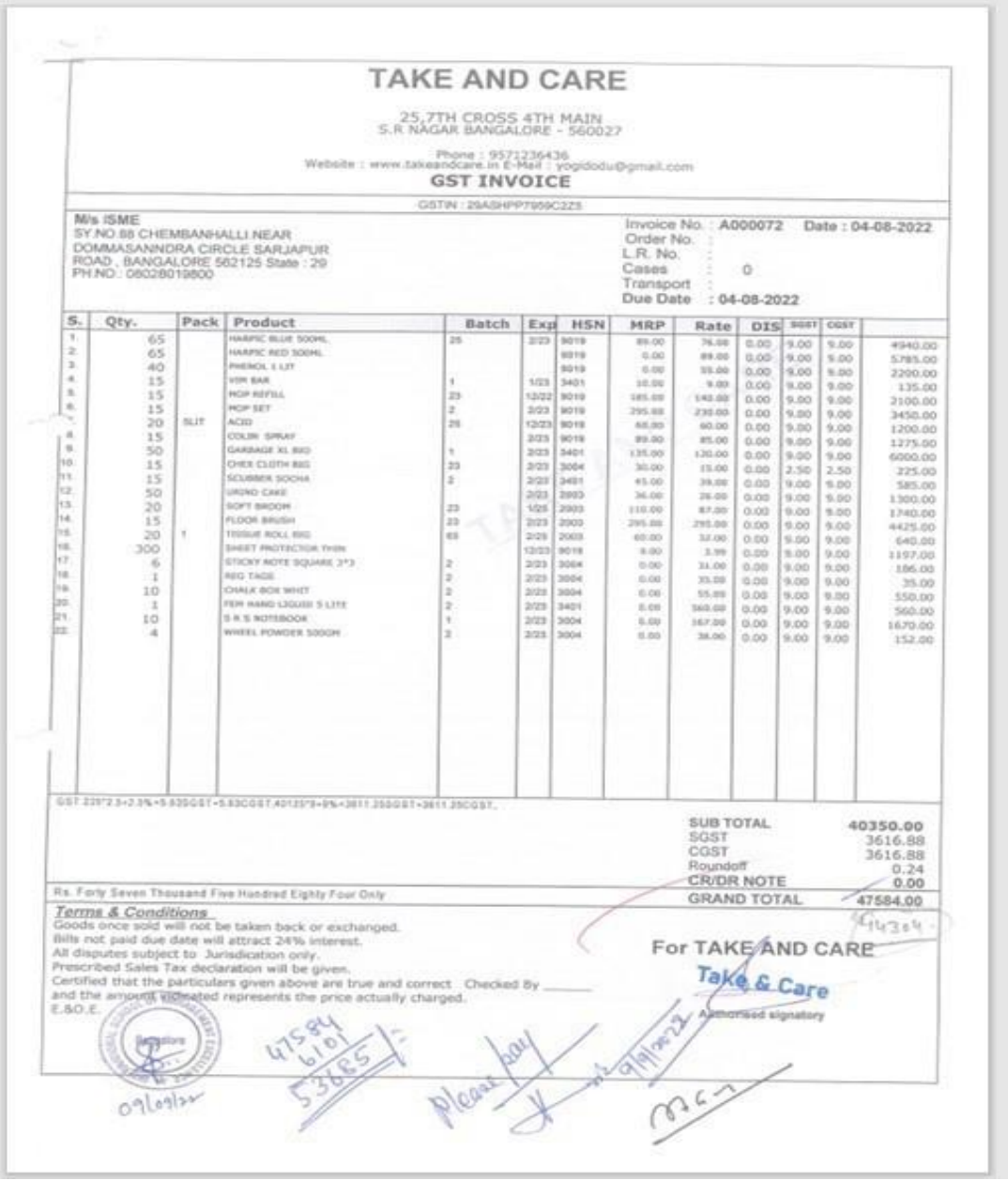


Figure 6-2: Cleaning of floors

6.2.3. Purchase of housekeeping materials

To keep the college campus clean and hygiene, the housekeeping materials like scrub, all-purpose cleaner spray, phenyls, acids, mops, garbage bags, chemical disinfectants, broom sticks, and waste bins are purchased regularly.

The purchased housekeeping materials are distributed to housekeeping staffs to carry out the cleaning activity. The sample image of purchase bill for housekeeping materials is shown in figure 6-3.



TAKE AND CARE

25,7TH CROSS 4TH MAIN
S.R NAGAR BANGALORE - 560027

Phone : 9571236436
Website : www.takeandcare.in E-Mail : yogidodu@gmail.com

GST INVOICE

GSTIN : 29ASHPP7959C2Z3

M/s ISME
SY.NO.88 CHEMBANHALLI NEAR
DOMMASANNDRA CIRCLE SARJAPUR
ROAD , BANGALORE 562125 State : 29
PH.NO : 08028019800

Invoice No. : A000072 Date : 04-08-2022
Order No. :
L.R. No. :
Cases : 0
Transport :
Due Date : 04-08-2022

S.	Qty.	Pack	Product	Batch	Exp	HSN	MRP	Rate	DIS	SGST	CGST	
1.	65		HARPIC BLUE 500ML	25	2/23	9019	89.00	76.00	0.00	9.00	9.00	4940.00
2.	65		HARPIC RED 500ML			9019	0.00	89.00	0.00	9.00	9.00	5785.00
3.	40		PHENOL 1 LIT			9019	0.00	55.00	0.00	9.00	9.00	2200.00
4.	15		VIM BAR	1	1/23	3401	10.00	9.00	0.00	9.00	9.00	135.00
5.	15		MOP REFILL	23	12/22	9019	185.00	140.00	0.00	9.00	9.00	2100.00
6.	15		MOP SET	2	2/23	9019	295.00	230.00	0.00	9.00	9.00	3450.00
7.	20	SLIT	ACID	25	12/23	9019	65.00	60.00	0.00	9.00	9.00	1200.00
8.	15		COLIN SPRAY		2/23	9019	89.00	85.00	0.00	9.00	9.00	1275.00
9.	50		GARBAGE XL BIG	1	2/23	3401	135.00	120.00	0.00	9.00	9.00	6000.00
10.	15		CHEX CLOTH BIG	23	2/23	3004	30.00	15.00	0.00	2.50	2.50	225.00
11.	15		SCUBBER SOCHA	2	2/23	3401	45.00	39.00	0.00	9.00	9.00	585.00
12.	50		URGNO CAKE		2/23	2903	36.00	26.00	0.00	9.00	9.00	1300.00
13.	20		SOFT BROOM	23	1/25	2903	110.00	87.00	0.00	9.00	9.00	1740.00
14.	15		FLOOR BRUSH	23	2/23	2903	295.00	295.00	0.00	9.00	9.00	4425.00
15.	20	1	TISSUE ROLL BIG	63	2/25	2003	60.00	32.00	0.00	9.00	9.00	640.00
16.	300		SHEET PROTECTOR THIN		12/23	9018	9.00	3.99	0.00	9.00	9.00	1197.00
17.	6		STICKY NOTE SQUARE 3*3	2	2/23	3004	0.00	31.00	0.00	9.00	9.00	186.00
18.	1		REG TAGS	2	2/23	3004	0.00	35.00	0.00	9.00	9.00	35.00
19.	10		CHALK BOX WHIT	2	2/23	3004	0.00	55.00	0.00	9.00	9.00	550.00
20.	1		FEVI HAND LIQUID 5 LITE	2	2/23	3401	0.00	560.00	0.00	9.00	9.00	560.00
21.	10		S R S NOTEBOOK	1	2/23	3004	0.00	167.00	0.00	9.00	9.00	1670.00
22.	4		WHEEL POWDER 500GM	2	2/23	3004	0.00	38.00	0.00	9.00	9.00	152.00

GST 229*2.3=2.3%+5.83SGST+5.83CGST,401.25*9=9%+3611.25SGST+3611.25CGST,

SUB TOTAL	40350.00
SGST	3616.88
CGST	3616.88
Roundoff	0.24
CR/DR NOTE	0.00
GRAND TOTAL	47584.00

Rs. Forty Seven Thousand Five Hundred Eighty Four Only

Terms & Conditions
Goods once sold will not be taken back or exchanged.
Bills not paid due date will attract 24% interest.
All disputes subject to Jurisdication only.
Prescribed Sales Tax declaration will be given.
Certified that the particulars given above are true and correct Checked By _____
and the amount indicated represents the price actually charged.
E.&O.E.

For TAKE AND CARE
Take & Care
Authorised signatory

09/09/22

47584
610
53685/-

Please pay

9/9/2022

Figure 6-3: Purchase bills for housekeeping materials

6.2.4. Bio- Waste Management

As part of maintaining hygienic environment for the girl's, the management has provided the sanitary napkin dispenser and sanitary napkin incinerator in the girl's toilet. The pictures of the same are given in figure 6-4.

Figure 6-4: Sanitary napkin incinerator installed in girls rest room

7. GREEN CAMPUS MANAGEMENT AUDIT

7.1. Facility Description

The institute 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 college is worth seeing and reflects aesthetic sense. The institute 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 college looks after the development and maintenance of the greenery in the campus. Photos taken during the audit are shown in figures 7-1 to 7-4.

Figure 7-1: Trees in the college campus




Figure 7-2: Plants in the college campus

Figure 7-3: Lawn area

Figure 7-4: Plantation near ladies hostel

7.2. Institutional Initiatives 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.

- Plastic free campus
- Green landscaping with trees, plants like vegetable, fruits and medicinal plants; lawns
- Paperless office: All communication regarding academics and administration are sent as e-mails and messages to faculty 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 image of garden maintenance tools is shown in figure 7-5.

Figure 7-5: Garden Maintenance Tools

7.2.2. Posters on Plastic Ban / Zero Plastic

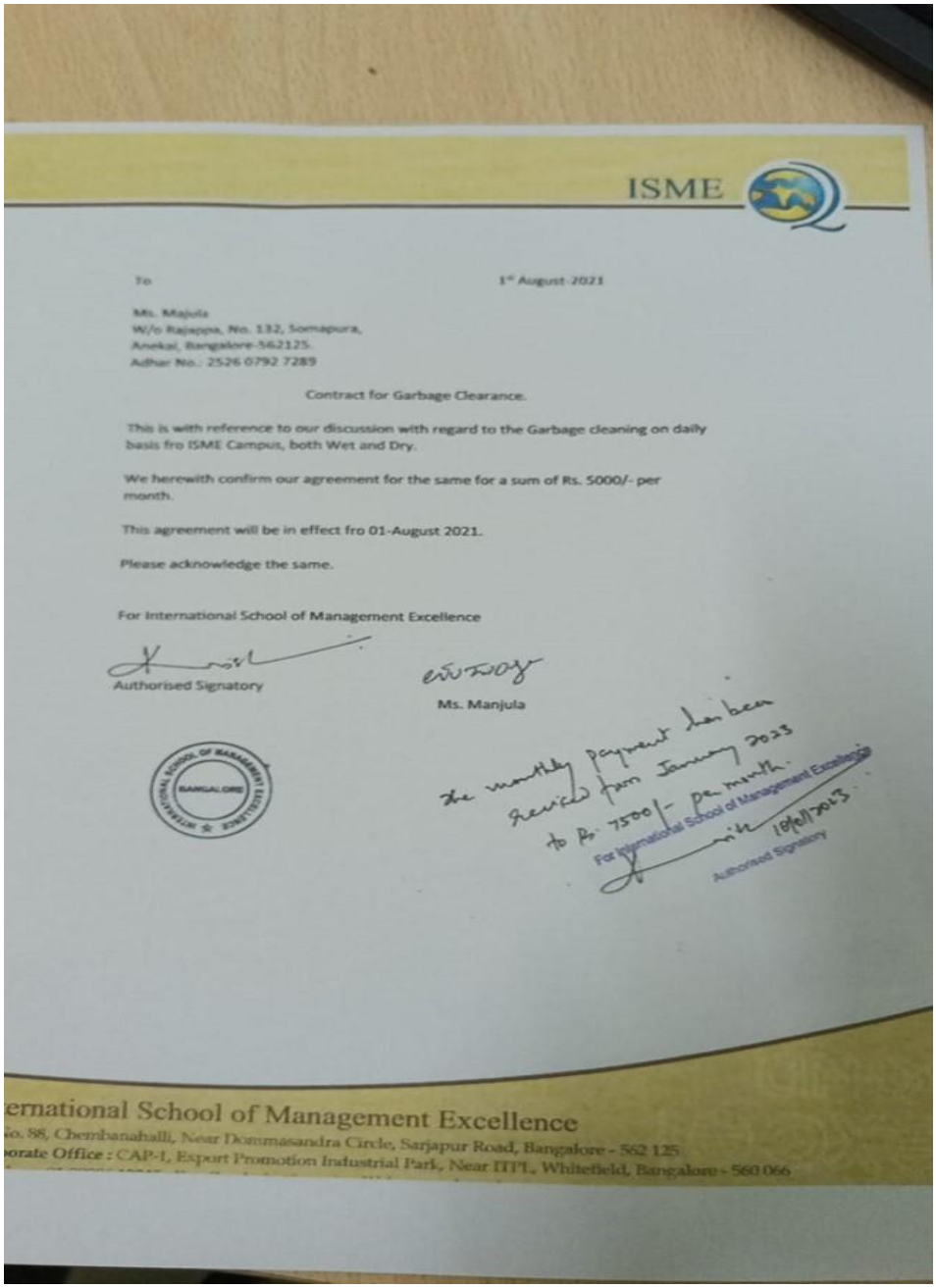
Different posters on 'Plastic Ban/Zero Plastic/Reduce, Reuse & Recycle' were placed in the campus to make students, staff and trespassers aware, the college is Plastic Free zone.

The sample images awareness posters are shown in figure 7-6.

Figure 7-6: Awareness poster

7.2.1. Garbage Clearance

The garbage collected in the college campus is stored in the garbage area. The stored garbage is disposed through third party agency. The college management has made an contract agreement with the third party agency for collection of garbage on daily basis. The copy of the contract is shown in figure 7-7.



ISME

To

1st August 2021

Ms. Majula
W/o Rajappa, No. 132, Somapura,
Anekal, Bangalore-562125.
Adhar No.: 2526 0792 7289

Contract for Garbage Clearance.

This is with reference to our discussion with regard to the Garbage cleaning on daily basis fro ISME Campus, both Wet and Dry.

We herewith confirm our agreement for the same for a sum of Rs. 5000/- per month.

This agreement will be in effect fro 01-August 2021.

Please acknowledge the same.

For International School of Management Excellence

Authorised Signatory

Ms. Manjula

The monthly payment has been revised from January 2023 to Rs. 7500/- per month.

For International School of Management Excellence

Authorised Signatory

19/01/2023

ernational School of Management Excellence

o. 88, Chembanahalli, Near Dommasandra Circle, Sarjapur Road, Bangalore - 562 125

orate Office : CAP-1, Export Promotion Industrial Park, Near ITPL, Whitefield, Bangalore - 560 066

Figure 7-7: MoU for garbage clearance

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.

8.2. Institutional Initiatives for Environment Conservation

8.2.1. Awareness campaign on environment conservation

Management has taken steps to create awareness among students and staff regarding:

- Creating awareness campaigns on Environment Conservation
- Awareness campaigns on avoiding use of plastics

Environment awareness drawing competition is been conducted for the students.

8.2.2. Workshop on trees in Bangalore

The management has conducted various workshop and expert talks to create the awareness among the students in environment conservation and sustainability activities. The picture of expert talk on types of trees available in Bangalore and the benefits is shown in figure 8-1.

Figure 8-1: Expert talk on types of trees available in Bangalore

8.2.3. Ramp for barrier friendly movement

Wheelchair ramps enable differently-abled as well as elderly people to enjoy complete freedom, as they allow users to move in and around the campus safely. The ramp facility available in college is shown in figure 8-2.

Figure 8-2: Ramp facility at college

8.2.4. Wheel chairs and Washrooms for differently abled persons

Wheelchair ramps, wheel chair and wash room are available for differently abled as well as elderly people. The ramp facility available in college is shown in figure 8-3.

Figure 8-3: Wheelchair and wash room for differently abled

8.2.5. Transport facility for students

The college provides safe and reliable transportation to students. The college operates a fleet of buses which are well connected with the city and provide students, faculty, and staff with the best transportation facilities. Students are picked up and dropped off by the buses on different routes throughout the city.

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 8-4.

Figure 8-4: Transport facility for students

8.2.6. 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 8-5.

Figure 8-5: Well-ventilated and day-light integrated class room and Library

8.2.7. 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, hostel, dining area, etc. Sample photo of LED lamp used in the some of the locations of the college area are shown in figure 5-8 and sample LED purchase bill is shown in figure 8-6.

Figure 8-6: LED lights installed in Campus

8.2.8. Installation of Solar Water Heater

Solar water heaters are installed in hostel for generating hot water. Sample photo of solar water heater used in the campus are shown in figure 8-7.

Figure 8-7: Solar Water Heater

The cost savings by installation of solar water heater are given in table 8-1.

S. No.	Description	Unit	Values
1	Solar water heater installed	L	3000
2	Total amount of heat produced	kCal/hr	90000
3	Electricity equivalent	kWh	104.7
4	No. of working days per year	days	250.0
5	Annual electricity savings	kWh	26162.8
6	Average electricity cost	Rs./kWh	8.25
7	Annual cost savings achieved per year	Rs. lakh/year	2.2
8	CO2 mitigations per year	Tons/year	22.2

Table 8-1: Annual cost savings by installation of Solar Water Heater