ENVIRONMENT AUDIT REPORT 2018- 2019

For Peepal Waste Managers

Partner

PRINCIPAL
MGIT(A)
INSTITUTE OF SCIENCE & TECHNOLOGY
Gandipet, Hyd-500 075

PREFACE

A healthy environment serves effective learning and provides a conducive learning environment. There are various efforts to address environmental education issues.The environmental monitoring system helps all the institution to set environmental examples for the community and to educate young learners to protect, manage and minimize the damage to environment, environmental education is necessary. It develops the required skills and expertise to handle the associated challenges. Such environment education to students is to impart knowledge, create awareness and provide skill to handle the environmental challenges.

MAHAVEER Institute of Science & Technology is determined to inculcate the emerging innovative generation and make them "Nurturing Future Leaders" with the continuous rise in expectation of essential leadership standards. The college has always strived to build such attitude towards environment amongst the students.

In view of the above, MAHVEER Institute of Science & Technology has intended to conduct the environment report of their campus to understand the present practices of sustainability with regard to various components of environment.

CERTIFICATE

This is to certify that we have carried out Environment Audit in the M/s Mahaveer Institute of Science and Technology, Vysapuri, Bandlaguda, Hyderabad, Telangana during 21st September 2018 and following observations presented below. The Management is proactive in maintaining conducive environmental taking initiatives by harnessing Solar Energy, by Planting Trees, through better water conservation, by effective Waste Management, Carbon foot print. We appreciate. The efforts of the M/s Mahaveer Institute of Science and Technology, Vysapuri, Bandlaguda, Hyderabad, Telangana in this regard.

For Peepal Waste Managers

Partner

PeepalWasteManagers,16-2-705/28,AndhraColony,Malakpet,Hyderabad-500036,India.
Phone:040-66663111,+91-9032029234 website:www.peepalwastemanagers.com

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Chapter – 1

Introduction

Mahaveer Institute of Engineering & Technology is sponsored by the Mahaveer Educational Society, which was established in 2001. The college is situated 3Km away from chandrayangutta Road, Telangana, India. It is located in 7.19 acres of serene, lush green and pollution free area. The Management is committed in assuring quality service to all its stake holders such as parents, students, alumni, employees and the community. Commitment and dedication is executed into our policy of continual quality improvement by establishing and implementing mechanisms and modalities, ensuring accountability at all levels, transparency in procedures and access to information and services.

MIST has adopted the best possible steps for managing the degradable and non- degradable waste. Management of degradable and non-degradable waste refers to collection, propertreatment and safe disposal. Risk and threats associated with waste disposals can be easily evaded by the knowledge on forms of wastes.

MIST has taken initiatives to segregate the waste at its source level which is the first and most important step in waste management. Waste generated in the campus is recycled and reused to the maximum extent. For this, all the housekeeping staff members are properly trained to segregate waste at its source level before the waste is dumped for proper disposal. The various forms of waste generated in the college campus are kitchen waste (organic), food waste, paper waste, E-waste, dry waste (leaves) and liquid waste, sewage, biomedical waste such as sanitary napkins, and few less hazardous chemicals from chemistry laboratory etc.

MIST practices the composting technique for organic waste. The waste that is generated from the canteen i.e., vegetable peels are mostly sent out to composting unit. Huge amount of garden waste is being generated in the campus, mostly in the form of leaves, which is deposited in separate chamber and composted to form manure and used for organic farming. Color coded waste

collection bins are placed in the college premises to collect solid waste. All the dry waste such as paper waste, old record etc and E-Waste like key boards, mother boards, printers, etc generated in the college will be collected by URBAN REBOX IT private Ltd, and undertake necessary measures for dispatch of the sorted recyclables for recycling as part of Swatch initiative.

Water is treated in RO system for providing safe drinking water to the students and faculty and the liquid waste generated by drinking water RO plant is used for gardening. The standard operating procedures are being adopted by chemistry department for safe disposal of few less hazardous chemicals which are collected from chemistry laboratory and other allied departments.

The adopted methods of waste management help the college in attaining a high level of performance with respect to the environmental safety. The practices used in the waste- management are eco-friendly, economically viable and as per legal & regulatory norms.

1.1 College Map

Total area of the campus – 7.19acres Total built in area of the campus – 6 acres

1.1. Introduction to Environmental Audit

Environmental audit is a systematic, documented, periodic and objective review by regular entities of facility operations and practices related to meeting environmental requirements. In other words, it is a management tool comprising systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with company policies, which would include regulatory requirements and standards applicable.

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organization of all kinds recognizes the importance of environmental matters. The environmental performance will be scrutinized by a wide range of interested parties. Thus it helps to improve the existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organizations environmental effect in a systematic and documented manner and will produce an environmental report.

Objectives

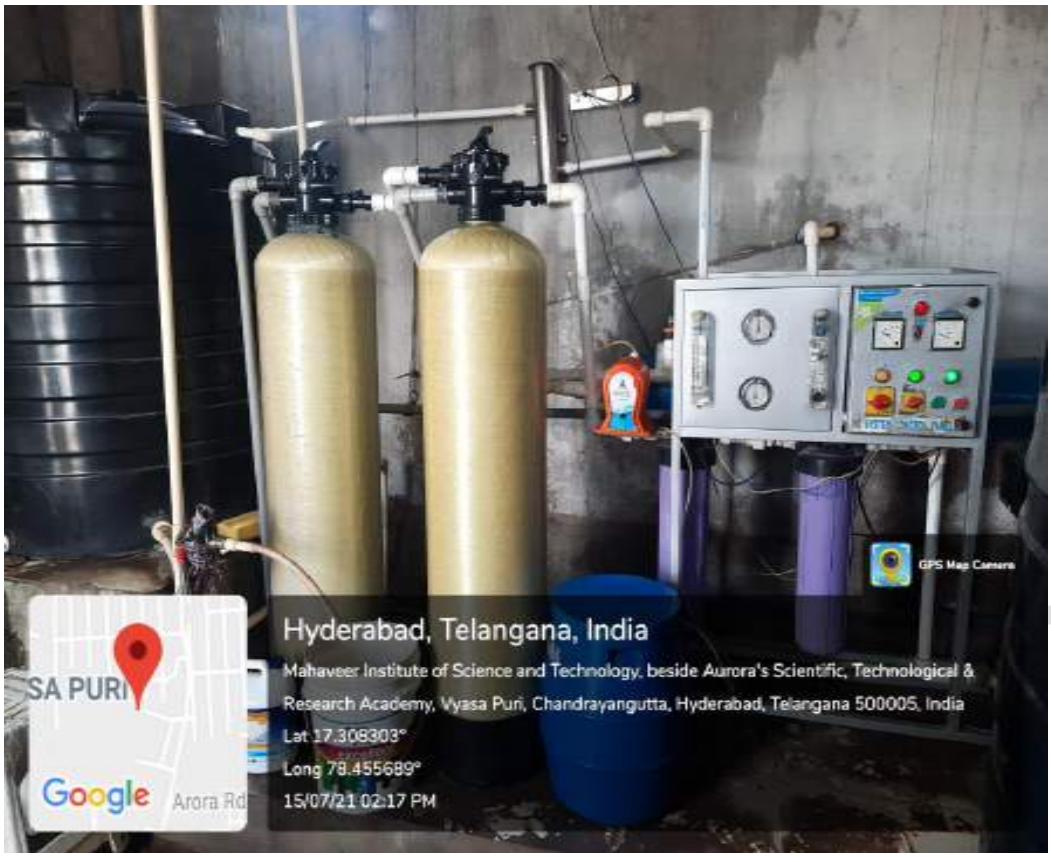
- To introduce and give awareness to the students to real concerns of environment and itssustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a present status report on environmental compliance.

Methodology

This includes different techniques such as physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. These studies cover various aspects of environment as mentioned in the report.

1.2. Synopsis

Water Management – Judicial usage of water is being maintained by the college administration and instructions were also given to the students. Rain water harvesting pits are dug in the campus for ground water recharge. RO plant service the drinking water requirement and bore water is used for other uses.



RO PLANT

Waste Management – Waste segregation at the source being practices by every department in the campus. Dry waste is sent to recycling units with the support of URBAN REBOX IT private LTD, an authorized agency of ITC. Though the wet waste segregation is being done and sent to compost units, it need to be streamlines for effective usage. The bins are placed as per the requirement.

MEMORANDUM OF UNDERSTANDING

This **Memorandum of Understanding** is made and executed **on 01st March' 2019** at **Hyderabad.**

BY AND BETWEEN

Mahaveer Institute of Science & Technology, Vyasapuri, Bandlaguda, Keshavagiri (P.O), Hyderabad-500005, its administrators, assigns and successors represented by Dr. Shankar Ram, Principal, who is duly authorized to sign and execute the MoU.

Being the First Part
AND

Urban Rebox IT Private Ltd, an authorized agency of ITC having its principal office situated at No. # 11-3-362/3, Mohammadguda, Secunderabad, Hyderabad-500061 and represented by Mr. D. Sai Krishna, Manager referred as **"Rebox"**

Being the Second Part

Whereas Mahaveer Institute of Science & Technology has agreed to collect and give away the dry recyclable waste including any kind of paper waste and old records generated in its college and form Swachh WOW Hyderabad Chapter.

1. **NOW THIS MOU WITNESSETH AS UNDER:**
   This is an agreement for a synergic alliance between Mahaveer Institute of Science & Technology, Vyasapuri, Bandlaguda, Keshavagiri (P.O), Hyderabad-500005 and Rebox for the social cause of recycling of Dry Waste and Environment Protection through recycling.

2. **Time period:** This MOU shall be for a period of one year commencing from the date of signing of this MOU.

3. **Roles and Responsibilities of Mahaveer Institute of Science & Technology:**

   1. To ensure source segregation of dry and wet waste at College premise through its Teaching staff, housekeeping staff and Students.
   2. Mahaveer Institute of Science & Technology will give away any kind of paper waste, dry recyclable waste and old records to Rebox at price agreed mutually. Rebox will pay Rs.7/kg for any kind of Paper waste and Old records/Dull white paper will pay Rs. 3/Kg, for metal scrap Rebox shall pay Rs. 9/Kg and for plastic waste Rebox will pay Rs. 4/Kg.
   3. Mahaveer Institute of Science & Technology shall form Swachh WOW Hyderabad Chapter in the college with Student Volunteers and adopt nearby Schools or Colonies to promote Source Segregation through student volunteers. MARI shall provide participation certificates to the students.
   4. Mahaveer Institute of Science & Technology shall provide students for Internship in WOW Program. MARI shall provide internship certificate to the students.

URBAN REBOX IT PVT.LTD.
#11-3-362/3, MR Complex, Srinivas Nagar, Padmarao Nagar,
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

4. Mahaveer Institute of Science & Technology shall provide students for Internship in WOW Program. MARI shall provide internship certificate to the students.
5. Mahaveer Institute of Science & Technology shall motivate students to bring dry recyclables like paper, plastic, metal etc. from their home and donate to WOW initiative.
6. Mahaveer Institute of Science & Technology will put-up color-coded bins for waste segregation at different points in College premises.

4. Roles and Responsibilities of URBAN REBOX:

1. ITC-MARI will train the students and housekeeping staff on source segregation and through them inculcate the habit of source segregation among the other students.
2. Rebox will collect dry recyclable waste and old records from College and bring to the Dry Resource Collection Centre (DRCC) without any spillage.
3. Rebox will organize sorting of the dry waste into different categories, baling, and appropriate disposal of dry waste.
4. Rebox shall coordinate with ITC and undertake necessary measures for dispatch of the sorted recyclables for recycling at its own cost.
5. Rebox will make payment to Mahaveer Institute of Science & Technology directly into their accounts for the dry recyclable waste collected against the accurate weighment and the type or category of the dry waste. The payment shall be made no later than 15 days from the date of purchase of dry waste from the waste collector. Franchisee on the request of Mahaveer Institute of Science & Technology may give New Notebooks and Stationery against the value of dry recyclable waste lifted.

5. Performance of Obligations

1. The details laid out in this MOU, notwithstanding the essence and spirit of this MOU is an understanding between Mahaveer Institute of Science & Technology and Rebox.

2. Any notice or other communication under or in connection with this agreement shall be in writing in the English language and shall be delivered personally or sent by way of e-mail to the party due to receive the notice or communication at its address set out in this contract or such other address as either party may specify by notice in writing to other.

ADDRESS FOR COMMUNICATION:
Following are the address to which all notices shall be sent:

For URBAN REBOX:
Urban Rebox IT Pvt Ltd
H.No. #11-3-362/3,
Mohammadguda, Secunderabad,
Hyderabad - 500061
Phone No.9000479471
Email ID: urbanreboxit@gmail.com

For Mahaveer Institute of Science & Technology,
Vyasapuri, Bandlaguda, Keshavagiri (P.O),
Hyderabad-500005
Phone No:
Email ID:

6. Execution of this Agreement shall be deemed to be
   a) A confirmation by both the parties that no benefit, either in cash or kind has been provided by either party to the other party or to any officer or employee, or any relative/ associate of any officer or employee of either party or of any of their associate institutions/companies in order to enter into this Agreement, and
   b) An undertaking by both the parties not to provide any benefit, either in cash or kind to any officer/employee/relative/associate of any officer or employee of either party as reward or consideration either for entering into this MOU or other matter relating to this Agreement.

7. Other Terms:

Force Majeure: Neither party shall be liable for damages for any delay or failure to perform its obligations here under, if such delay or failure is due to reasons beyond the control of the concerned party including without limitation, strikes, riots, wars, fires, epidemics, quarantine restrictions, unusually severe weather, earth quakes, explosions, acts of God or state or any public enemy or acts mandated by applicable laws, regulation or order, whether valid or invalid, of any Governmental body.

8. **Dispute Resolution**: It is understood by both the parties that this Agreement is for a social cause and not to make any profit out of the understanding. The Parties covenant that they will comply with all applicable laws and regulations in their conduct pursuant to this Agreement. Any dispute arising out of this Agreement shall be first attempted to settle amicably between the parties.

9. **Arbitration**
Any dispute which is not resolved amicably shall be finally settled by binding arbitration in respect to the matters concerning to the MOU with the Sole Arbitrator to be appointed by the mutual consent of both the parties. The Parties agree that the decision or award resulting from arbitration shall be final and binding upon the Parties.

Pending the submission of and/or decision on a dispute, the Parties shall continue to perform their respective obligations under this Agreement without prejudice to a final adjustment in accordance with such arbitration award

10. **Governing and Jurisdiction**: This Agreement is subjected to the Jurisdiction of Courts at Hyderabad.
    - Both the parties shall agree that it will not make use of, disseminate, or in any way disclose any confidential information to any person, firm or business. Furthermore, the existence of any discussions, negotiations or agreements in progress between the parties shall not be released to any form of public media without written approval of both parties.

11. **Amendments**
This Agreement and the Schedules together constitute a complete and exclusive understanding of the terms of the Agreement between the Parties on the subject hereof and

no amendment or modification hereto shall be valid and effective unless agreed to by all the Parties hereto and evidenced in writing.

12. **NOTICE /Termination**

Any notice required to be given hereunder shall be given in writing at the address of each party set forth as below in this agreement or to such other address either party may substitute by written notice to the other. Either party may terminate this Agreement by giving 30 days written notice to the other party.

In witness whereof the parties hereto have signed this agreement on the day, month and year mentioned hereinbefore.

For Mahaveer Institute of Science & Technology

Principal
Mahaveer Institute of Science & Technology
Vyasapuri, Bandlaguda, Keshavagiri (P.O),
Hyderabad-500005

Witness:

1.

2.

For URBAN REBOX

D Sai Krishna
Operations Manager

URBAN REBOX IT PVT. LTD. HYD

Annexure 1

Below are the items and rates listed:

Sl.no	Description	Price (Rs/Piece)
1.	**E-waste:**	
	CRT Monitors	50.00
	LCD/LED Monitors (working condition)	250.00
	LCD/LED Monitors (Non-working condition)	70.00
	CPU (working condition)	280.00
	CPU (non-working condition)	150.00
	Keyboard	7.00
	Mouse	1.00
	Dot Matrix Printer	60.00
	Laser Jet/ Desktop Printer	130.00
	Core/Dual core Laptop (non-working condition)	400.00
	i Processor Laptop (non-working condition)	500.00
	Core/Dual core Laptop (working condition)	900.00
	i Processor Laptop (working condition)	1500.00
	UPS	60.00
	Cables (per KG)	10.00
	SMPS	10.00
	Head Phones	6.00

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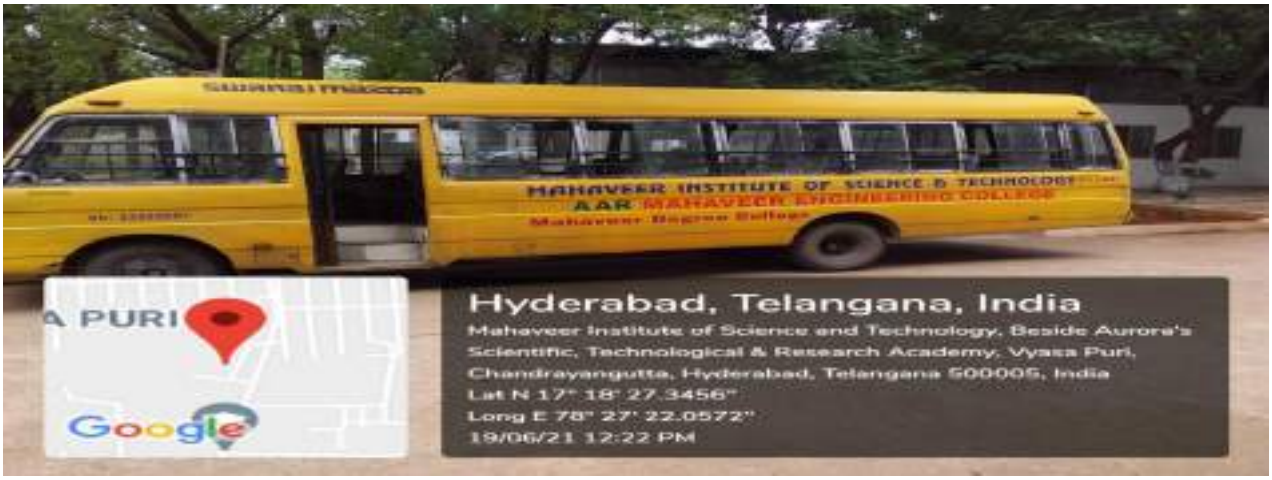
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

Transportation – Majority of the students use public transport creating less carbon footprint. College also provides bus facility for the students and faculty members.



TSRTC PUBLIC TRANSPORT COLLEGE BUS STOP

Students Awareness Campaigns – Various campaign activities are being initiated by college and run by the students. Activities based on water and energy conservation are being done in the college premises which is evident by the display stickers on good practices in the required places of every building. NSS students prepare their activities and conduct for mass awareness in and around the campus.

Infrastructure - Apart of the building and other facilities college administration has taken upeco-friendly initiative like

- RO Plant for safe drinking water
- Rainwater harvesting pits for ground water recharge
- College management is planning to install Biogas plant for wet waste management.
- MOU with ITC for safe disposal and recycle of paper waste plastic and E-waste
- College management is planning to install Sanitary napkin burners ladies toilets for safe disposal.


GPS Map Camera
Hyderabad, Telangana, India
Mahaveer Institute of Science and Technology, beside Aurora's Scientific, Technological &
Research Academy, Vyasa Puri, Chandrayangutta, Hyderabad, Telangana 500005, India
Lat 17.308303°
Long 78.455689°
15/07/21 02:17 PM
SA PURI
Google
Arora Rd

RO PLANT

RAIN WATER HARVESTING PIT

1.3. Recommendations

- Overall Environmental plan for strategic implementation of eco-friendly practices is to be framed every year. This help to streamline the existing good practices that are already being implemented. This also gives increase the scope of environmental activities for students. Strict implementation of the plan also brings behavior change amongst the students‟ fraternity.

- Environment auditing is to be carried out every year to evaluate the outcomes of the environmental activities. This helps the college to implement activities like cost efficiency and conservation of the available natural resources.

- Continuous check of the LED bulbs usage with the help of student team and proper maintenance of the solar power plant also increase the energy efficiency of the system. Proper maintenance and judicial use of electricity will reduce the energy consumption of the college.

- The old machinery like computers, printers, fans and other electronic appliances are to be repaired, maintained or changed regularly to reduce overall energy consumption.

- Rain water harvesting structures are to be built with proper scientific method for all buildings for water conservation within the campus. And students should take part in the conservation of water of the entire campus so that they also learn the system and good practices.

- Waste water from laboratories and canteens are to be controlled and used for garden only after proper treatment.

- Repair leaking taps and pipes at regular intervals to conserve water.

- Specific Waste Management Plan should be developed and adopted to manage solid waste within the campus. Swachh Survekshan of Swachh Bharat

- Mission is also now giving scope for the involvement of the college and general public inlarge. So college can take part in their programmes.

- Management has to make the campus plastic free zone. Usage of single use plastic is to be banned completely from the campus especially in the plastic bags, glasses, cups / plates. The manure of compost can be used for plants avoid using pesticides. Thereshould be a system for better management of hazardous waste management.

- Bio toilets can be installed for better management of fecal sludge.

- Vehicle pooling can be promoted for both students and faculty. Initially this can be declared by the management or through student groups on particular days.

- Environmental education should be part of curriculum and activities irrespective of the subjects. Students should be made part of environmental activities being organized in the campus.

- More display board should be set up on various conservation aspects.

- Students and faculty should be trained on carbon footprint calculation and reduce carbon emissions.

- Students are encouraged to do innovative activities at this level so that they feel motivated and think on eco-friendly solutions.

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Chapter 2

ENERGY

Energy audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital production and utility activities. It will help to understand more about the ways energy utilized and help in identifying the areas where waste can occur and where scope for improvement exists.

Energy audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating and maintenance practices of a campus. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply decision on appropriate energy mix, decision on using improved energy conservation equipment, instrumentations and technology. It is proven that energy saving about 15 to 30% is possible by optimizing use of energy efficient equipment at the time of replacements.

MIST has come up with energy efficient technologies like installation and usage of LED Bulbs. They also have range of eco-friendly activities involving students of NSS.

2.1. Objectives

The main objectives of conducting energy audit are as follows:

- To study the present pattern of energy consumption
- To identify potential areas for energy optimization
- To recommend energy conservation proposals with cost benefit analysis

Energy Source within the campus

Institute uses energy from:

- 100 KW Solar power plant installed in the campus.
- Electricity from TSSPDCL

A view of MIST 100kW solar power plant

Connected Load					
Old Building Connected Load					
S. No	**Location**	**Description (Items)**	**Quantity (Nos)**	**Rating (W)**	**Total (KW)**
1	Building 1 (Old Building)	Split ACs (1.5Ton)	43	1725	74.2
		Fans	294	80	23.52
		Tubes Lights (4')	270	40	10.8
		Tubes Lights (2')	1000	20	20
		Computers with Monitors	1040	250	260
		UPSs	14	6KVA&10KVA	112
		OHPs	21	125	2.63
		Lab Equipment	All Labs	Different	120.75
		Other Loads (Oven , Fridge, etc)	Different	Different	2
Total Load in KW					**625.9**

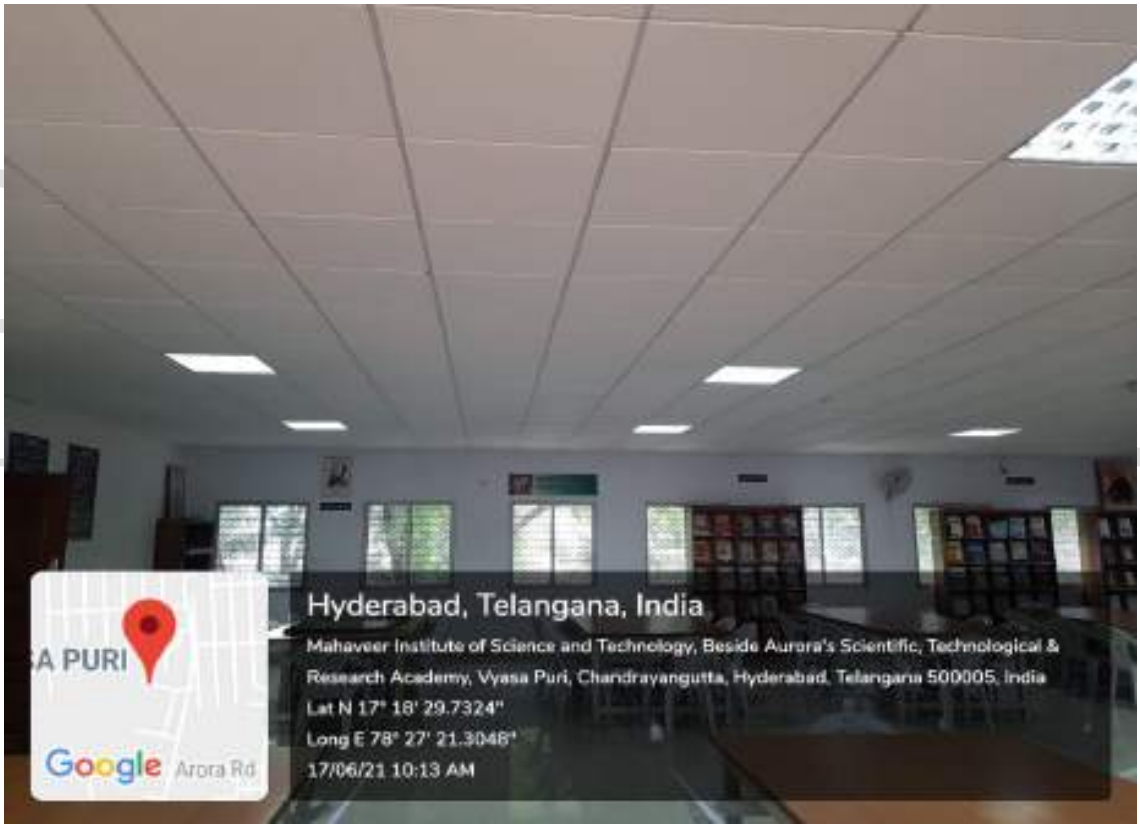
NEW Building-Connected Load					
S. No	**Location**	**Description (Items)**	**Quantity (Nos)**	**Rating (W)**	**Total (KW)**
1	Building 2 (New Building)	Split ACs (1.5Ton)	0		0
		Fans	203	80	16.24
		Tubes Lights (4')	155	40	6.2
		Computers with Monitors	37	250	9.25
		UPSs	1	6KVA&10KVA	6
		OHPs	11	125	1.38
		Lab Equipment	All Labs	Different	130.55
		Other Loads (Hot air Oven, etc)	Different	Different	2.5
Total Load In KW					**172.115**

MG Set Rating		
S. No	**Rating (KVA)**	**Total (KW)**
1	125	125 (Runing)
2	160	160 (Spare)
Total in KW		**285**

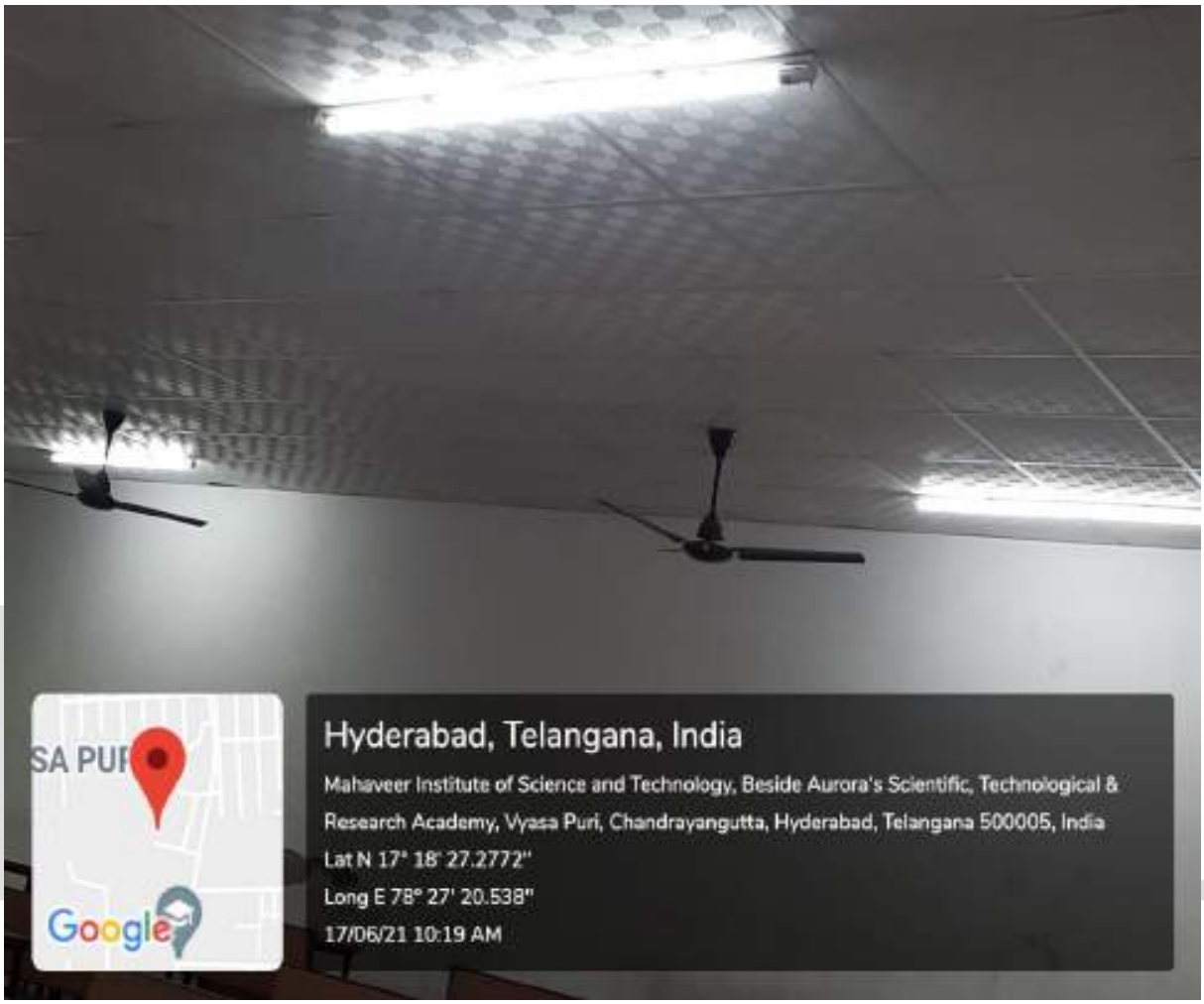
2.2. Annual Power saving through LED Bulbs

total requirements	Coverage (%) through LED Bulbs	Coverage (%) through other sources
68232W	10416W(18.060%)	57672W(81.94%)

Energy saving through the replacement of LED bulbs was a good option. Apart from this awareness programmes organized by NGC and NSS students has also been instrumental in reduced energy consumption.



LED BULBS INSTALLED IN LIBRARY



LED BULBS INSTALLED IN CLASS ROOMS

2.3. Transportation

The college transportation includes wide variety of vehicles including the buses provided by thecollege. The following are the details:

No. of buses	11
No. of students bus transport	300
No. of students using public transport	850
No. of faculty using public transport	nil
No. of faculty own vehicles	40
No. of students own vehicles	200
No. of buses having pollution certificate	11
No. of outside vehicles visited in the year	~1200
Fuel consumption in litres/Year	27500 lts

Institute utilizes11 buses as public transport facility to the students and faculty. This has reduced pressure on the fuel usages for various other vehicles. And also about 60.71 % of the total strength including students & faculty are using public transport. Further about 21.42% students use college bus facility.

Chapter -3

WATER

Virtually everything we do or use each day involves water. Yet, we do not give it the importance that is due to it. India will soon be a water-stressed country and we all need to work towards our water security. As our populations continue to grow and shift, the availability of quality water resources is in decline. Pollution, climate change and construction of cities in dry regions are some of the factors exacerbating evolving supply/ demand imbalances. To account this, it is essential that man utilize existing water resources in the most careful, efficient manner. Water audits provide a rational, scientific framework that categorizes all water use. It is a tool to overcome drought related problem, shortage, leakage and losses.

Simple actions can be adopted to reduce the wastage of water and use it wisely. Water audit is aqualitative and quantitative analysis of water consumption to identify means of Reducing, Reusing and Recycling of water. Water consumption patterns are to be identified and problems are to be fixed like leaks & overflow, identify the points where water loss is observed, identify the solutions, assign the responsibility for implementation, prepare a monitoring schedule and assign a person for monitoring.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the activities for water treatment and reuse. The relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible institution examine its water use practices.

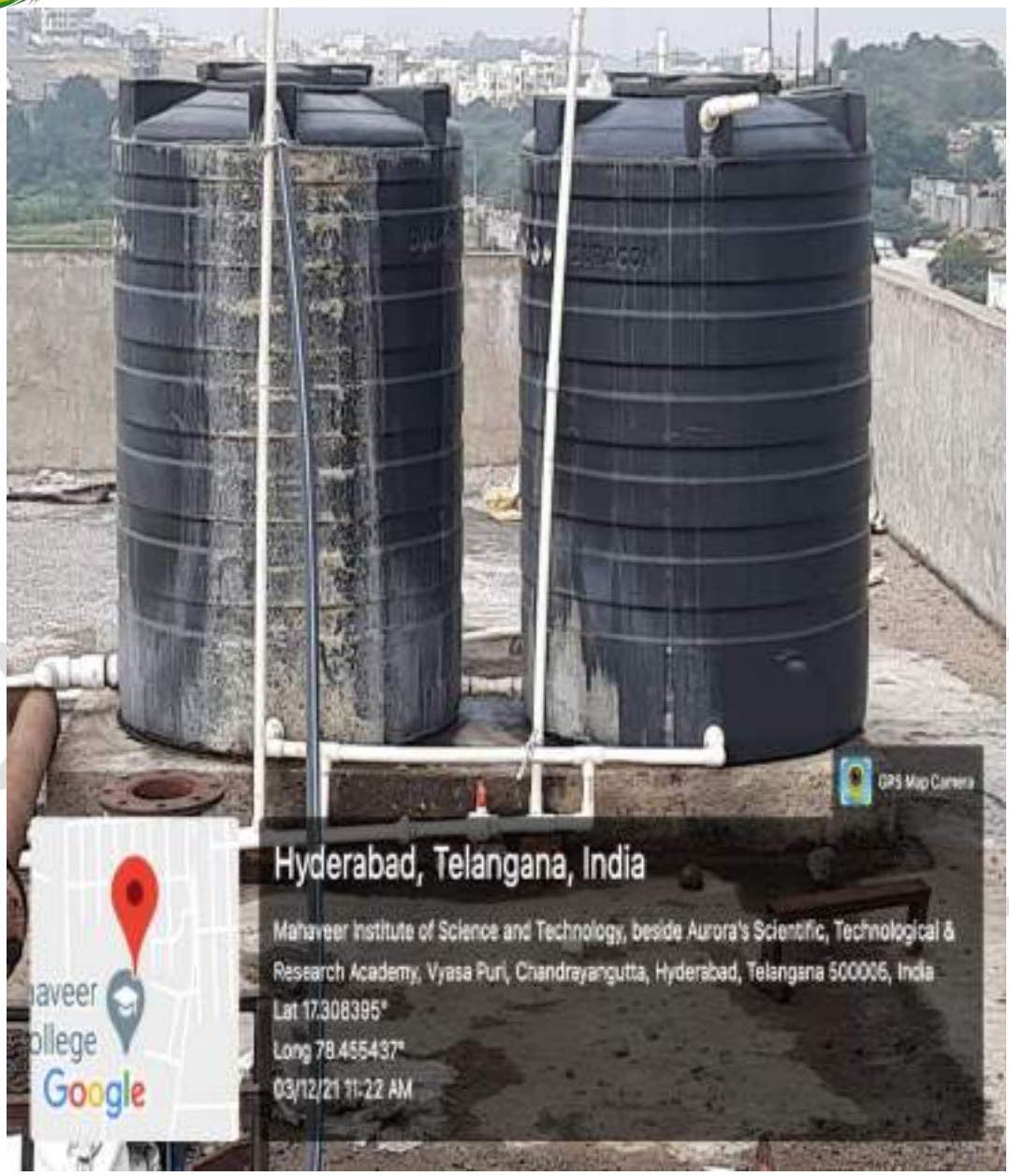
3.1. Sources of water

The water source is bore well only. The campus has Overhead tanks for each building along with bore well. For drinking water RO plant is set up.

RO PLANT

3.2. Water Consumption

S.NO	Location	Length of Tank (L)(m)	Width of Tank (B)(m)	Height of Tank (H)(m)	Volume of Tank (V)(m^3)	Vol.of Tank (Liters)
1	Main block A	17.9	13.4	4.10	278475	27847.52
2	Main block B	17.1	13.6	4.10	27000	27000
3	New Block A	-	-	-	-	1000
4	New Block B	-	-	-	-	1000
MIST Water Consumption						**56,847.52**


GPS Map Camera
Hyderabad, Telangana, India
Mahaveer Institute of Science and Technology, beside Aurora's Scientific, Technological &
Research Academy, Vyasa Puri, Chandrayangutta, Hyderabad, Telangana 500005, India
Lat 17.308395°
Long 78.455437°
03/12/21 11:22 AM
Google

WATER TANKS

3.3 WATER ANALYSIS REPORT done by in environmental engineering lab of MIST

Parameter/ WHO permissible level	Observed Value		Methodology
	Sample 1 drinking water	Sample2 Bore well water	
colour	Colour less	Colour less	
pH/6.5-6.8	**5.7**	**6.1**	**pH meter**
Turbidity /5-10NTU	**2**	**10**	**Turnidity meter**
Conductance/0.4mS cm-1	**15.6**	**8.22**	**Conductivity meter**
Fe/0.30ppm	**0.2**	**0.2**	**spectroscopy**
Na/200ppm	**245**	**215**	**Flame photometer**
k/12 ppm	**12**	**13**	**Flame photmeter**
Mg/30 ppm	**72**	**75**	**Titrimeteric**
Ca/75 ppm	**140**	**150**	**Titrimeteric**
F-/1.5 ppm	**0.4**	**0.5**	**Titrimeteric**
Cl-/250 ppm	**8.4**	**20.51**	**Titrimeteric**
NO3-/ 50 ppm	**42**	**43**	**spectroscopy**
SO4/250 ppm	**278**	**260**	**Turbidity meter**

Sample 1:– Drinking Water

Sample 2:– Bore well water

3.3. RO Plant

- RO plant installed for ensuring safe drinking water for students and faculty
- The liquid waste generated by drinking water RO Plant is used for gardening

RO PLANT

3.4 Rain Water Harvesting Structure:

MIST takes the necessary measures to collect and reuses rain water. Surface runoff collected from the roads and open ground is allowed to flow through proper channels and then allowed to infiltrate into the ground to recharge ground water. Rain water is collected from the roofs of building through PVC pipes and then allowed to sell designed rain water structures. Rain water harvesting pits are properly designed and constructed to recharge the aquifers. Each recharge pit has size of 4ft X 4 ft X 6 ft and depth of each pit from the bottom consists of 1.5 ft gravel/pebbles, 1.5 ft coarse sand and 2 ft left for water collection.

RAIN WATER HARVESTING PIT

Chapter - 4

4 WASTE MANAGEMENT

4.1. About Waste Audit

The purpose of the waste audit is to gain a detailed understanding of the types and weights of material being generated. The recommendations can be used to improve the economic and environmental performance of waste management efforts. For this audit, there is a need to discover the waste being generated and material are recyclables. Further the dispose mechanism adopted for both wet and dry waste has to be considered during audit. An effectivewaste reduction program must be based on current and accurate information on the quantity and composition of the waste stream. Therefore, there should be systematic procedure to review operations and subsequently, waste generation. Performing this exercise will definethe composition of your discards by examining how materials enter and exit your facility.

All operations produce waste and there is nothing wrong by recognizing it. However today concern is over waste generation and increasing costs of collection and disposal are good reasons to find out how to reduce, increase recycling and try to cut costs. An audit alone will not reduce your waste. Rather, it is the starting point that will enable your work to make informed decisions on how to allocate resources for source reduction and recycling programs.

In long run this saves money, reduces waste and disposal costs and creates positive environment campus image. This also helps in devising the ways and methods of reducing wastes at the source.

Hazardous Waste – Institute adopts standard operating procedures for safe disposal of hazardous chemicals collected in the chemistry laboratory and other allied departments. The chemicals like acids utilized for experiments are very negligible hazardous chemicals.

4.2. Waste classification & Quantity

MIST has following solid waste management:

- Waste collection bins are placed in the classrooms, canteen and in the college hostels to collect the solid waste materials like cool drink cans/ bottles, paper etc
- Around 80 Kg/day organic waste is being generated from the canteen. College management is planning to install a Biogas plant near the canteen to utilize organic waste like food waste and animal dung.
- Huge amount of garden waste is being generated in the campus, mostly in the form of leaves & twigs, which is deposited in separate chamber and composted. This manure is used for organic farming.
- Waste Material from the construction of building, such as cement, brick pieces, gravel, sand etc are collected and reused for land filling and other small constructions in the college.
- College Management has banned the usage of plastic bottles in the campus.

SNo	Source	Types of Waste	Quantity of waste produced per year
1	Canteen	Food	220 Kgs
		Plastic	500Kg
2	Labs, Classrooms, administrative office	Books, papers	17 tons
3	Labs	E-Waste	28 Kgs
4	Construction Site	Construction Waste	950 Kgs
5	Garden	Horticulture	65 Kgs
6	Garden & Campus	Rubbish	3600 Kgs
7	Washrooms	Sanitary	450 Kgs
8	Chemistry Labs	Chemical Waste	8 Kgs

Source	Type of waste	Description
Canteen	Food	Waste obtained as result of preparation, cooking and serving of food, waste produced due to handling market refuse.College management is planning to install a Biogas plant near college canteen to utilize food waste and animal dung.
	Plastic	The plastic waste consists of used water bottles, broken chairs, milkshake tins etc. These are collected every day in the evening and are stored and sent to recycling unit with the support of Urban Rebox it pvt ltd,An authorized agency of ITC.
Labs, classrooms, administrative office	Books & Other papers	Books, newspapers, record etc are collected at the end of each semester and sent to recycling unit. Similarly the exam papers, sheets are collected and recycled every year.
Labs	E-Waste	Mainly consists of chips, electronic material etc. These materials are also sent to recycling unit with the support of Urban Rebox it pvt ltd,An authorized agency of ITC..
ConstructionSite	Construction Waste	Consists of the waste produced during construction or repairs of the blocks. It consists of cement, card board, wood, iron material etc
Garden	Horticulture	Consists of twigs, dry leaves, flowers & fruits fallen from the plants etc
Garden & Campus	Rubbish	It includes two types of waste 1. Combustible (primarily organic), paper card boards, cartons, wood, leather, grass, leaves etc 2. Non-combustible (primarily inorganic)- metals, stones and grass etc
Washrooms	Sanitary pads	It consists of sanitary waste like pads.College management is planning to install sanitary napkin pads for safe disposal.
ChemistryLabs	Chemical Waste	The chemical waste mainly consist of chemicals that are used in laboratory and the chemicals which are expired cannot be used further

4.3. Collection & Storage of waste

- The Wet waste is being sent to compost unit and resulted manure is used for plants in the campus. And the dry waste is collected separately item wise and sent to recycling unit with the support of Urban Rebox IT private Ltd, agency of ITC. Initially they the stored at safe place within the campus and then collected by Urban Rebox IT private Ltd, agency of ITC monthly once depending on the quantity of the material. Twin bins are installed at required places and for wet waste two types of compost units are being maintained. College management is planning to install a Biogas plant near the canteen to utilize organic waste like food waste and animal dung.

COLLECTING DRY AND WET WASTE BINS

4.4. E-Waste Management

- Computers and their parts, telephones, printers and other electronic devices becomeobsolete or do not function properly after some years are considered to be e- waste.
- Proper collection and disposal of e-waste is very important as they are mostly made ofhazardous metals like lead, cadmium etc.
- All the E-Waste like key boards, mother boards, printers etc generated in the collegepremises is stored in a separate room.
- Institute has MoU with Urban Rebox IT private Ltd, agency of ITC, for the safe disposal of E-Waste.
- Urban Rebox IT private Ltd, agency of ITC collect the E-Waste periodically.
- The printer cartridges are refilled outside the college.

MARI

WOW

Certificate of Appreciation

ITC LIMITED - PAPERBOARDS & SPECIALITY PAPERS DIVISION

Sincerely thank

MAHAVEER INSTITUTE OF SCIENCE AND TECHNOLOGY

for partnering with WOW-Wellbeing Out of Waste, a Nationwide Recycling Initiative of ITC and contributing 2180Kgs of dry recyclable waste for recycling during the period of 2019-20

We look forward to your continued support in making India
SWACHH & GREEN
RECYCLE MORE & PROTECT ENVIRONMENT

Sib Sankar Bandyopadhyay

NOISE LEVEL:

The college is very quiet and no noise pollution is seen. The maximum observed noise level is between 55-77dB in most of the places and times 80 to 85dB near some of machines in Lab. Noise levels are well within limits.

Note:

As per the Factories Act 1948 Permissible Exposures in cases of continuous Noise is 90bBA is to be permitted.

SOLAR POWER:

A 100kWp Solar power plant is established to reduce dependency on Grid power which is predominantly fossil fuel based. Green Energy Percentage is about 50%.

College is already using a Solar powered UPS and Solar Street Lights.

WASTE PAPER STORE ROOM

E-WASTE STORE ROOM

E-WASTE STORE ROOM

E-WASTE CARRYING VEHICLE OF URBAN REBOX IT

Conclusion

- The overall environment of the college campus is being safe guarded with various activities. The utilization of the renewable resources is being done through Solar Power Plant and less energy consumption through LED Bulbs. Similarly waste water treatment through STP is another eco-friendly initiative of the college management.
- Waste Management is also effectively managed through safe disposal systems of wet and dry waste. Especially recycling of e-waste, plastic waste and safe disposal of sanitary napkins etc. Apart from the implementation of the above, the college management has also been very keen on involving students continuously in creating awareness through several activities by NSS Club.
- Dry waste and E-Waste is sent to recycling units with the support of URBAN REBOX IT private LTD, an authorized agency of ITC

For Peepal Waste Managers

Partner

PRINCIPAL
MAHAVEER
INSTITUTE OF SCIENCE & TECHNOLOGY
Bandlaguda, Hyd-500 005

ISWA

ENVIRONMENT AUDIT REPORT

2019-2020

For Peepal Waste Managers

Partner

PRINCIPAL
MAHAVEER
INSTITUTE OF SCIENCE & TECHNOLOGY
Bandlaguda, Hyd-500 005

ISWA

Indian Biogas Association

PeepalWasteManagers,16-2-705/28,AndhraColony,Malakpet,Hyderabad-500036,India.
Phone:040-66663111,+91-9032029234 website:www.peepalwastemanagers.com

PREFACE

A healthy environment serves effective learning and provides a conducive learning environment. There are various efforts to address environmental education issues.The environmental monitoring system helps all the institution to set environmental examples for the community and to educate young learners to protect, manage and minimize the damage to environment, environmental education is necessary. It develops the required skills and expertise to handle the associated challenges. Such environment education to students is to impart knowledge, create awareness and provide skill to handle the environmental challenges.

MAHAVEER Institute of Science & Technology is determined to inculcate the emerging innovative generation and make them "Nurturing Future Leaders" with the continuous rise in expectation of essential leadership standards. The college has always strived tobuild such attitude towards environment amongst the students.

In view of the above, MAHVEER Institute of Science & Technology has intended to conduct the environment report of their campus to understand the present practicesof sustainability with regard to various components of environment.

CERTIFICATE

This is to certify that we have carried out Environment Audit in the M/s. Mahaveer Institute of Science and Technology, Vysapuri, Bandlaguda, Hyderabad, Telangana during 18 November 2019 and following observations presented below. The Management is proactive in maintaining conducive environmental taking initiatives by harnessing Solar Energy, by Planting Trees, through better water conservation, by effective Waste Management, Carbon foot print. We appreciate The efforts of the M/s Mahaveer Institute of Science and Technology, Vysapuri, Bandlaguda, Hyderabad, Telangana in this regard.

For Peepal Waste Managers

Partner

PeepalWasteManagers,16-2-705/28,AndhraColony,Malakpet,Hyderabad-500036,India.
Phone:040-66663111,+91-9032029234 website:www.peepalwastemanagers.com

TABLE OF CONTENTS

Chapter – 1

Introduction

Mahaveer Institute of Engineering & Technology is sponsored by the Mahaveer Educational Society, which was established in 2001. The college is situated 3Km away from chandrayangutta Road, Telangana, India. It is located in 7.19 acres of serene, lush green and pollution free area. The Management is committed in assuring quality service to all its stake holders such as parents, students, alumni, employees and the community. Commitment and dedication is executed into our policy of continual quality improvement by establishing and implementing mechanisms and modalities, ensuring accountability at all levels, transparency in procedures and access to information and services.

MIST has adopted the best possible steps for managing the degradable and non- degradable waste. Management of degradable and non-degradable waste refers to collection, propertreatment and safe disposal. Risk and threats associated with waste disposals can be easily evaded by the knowledge on forms of wastes.
MIST has taken initiatives to segregate the waste at its source level which is the first and most important step in waste management. Waste generated in the campus is recycled and reused to the maximum extent. For this, all the housekeeping staff members are properly trained to segregate waste at its source level before the waste is dumped for proper disposal. The various forms of waste generated in the college campus are kitchen waste (organic), food waste, paper waste, E-waste, dry waste (leaves) and liquid waste, sewage, biomedical waste such as sanitary napkins, and few less hazardous chemicals from chemistry laboratory etc.

MIST practices the composting technique for organic waste. The waste that is generated from the canteen i.e., vegetable peels are mostly sent out to composting unit. Huge amount of garden waste is being generated in the campus, mostly in the form of leaves, which is deposited in separate chamber and

composted to form manure and used for organic farming. Color coded waste collection bins are placed in the college premises to collect solid waste. All the dry waste such as paper waste, old record etc and E-Waste like key boards, mother boards, printers, etc generated in the college will be collected by URBAN REBOX IT private Ltd, and undertake necessary measures for dispatch of the sorted recyclables for recycling as part of Swatch initiative.

The liquid waste generated by drinking water RO plant is used for gardening. The standard operating procedures are being adopted by chemistry department for safe disposal of few less hazardous chemicals which are collected from chemistry laboratory and other allied departments.

The adopted methods of waste management help the college in attaining a high level of performance with respect to the environmental safety. The practices used in the waste- management are eco-friendly, economically viable and as per legal & regulatory norms.

1.1 College Map

Total area of the campus – 7.19acres

Total built in area of the campus – 6 acres

1.1. Introduction to Environmental Audit

Environmental audit is a systematic, documented, periodic and objective review by regular entities of facility operations and practices related to meeting environmental requirements. In other words, it is a management tool comprising systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with company policies, which would include regulatory requirements and standards applicable.

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organization of all kinds recognizes the importance of environmental matters. The environmental performance will be scrutinized by a wide range of interested parties. Thus it helps to improve the existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organizations environmental effect in a systematic and documented manner and will produce an environmental report.

Objectives

- To introduce and give awareness to the students to real concerns of environment and itssustainability.
- To secure the environment and cut down the threats posed to human health byanalyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a present status report on environmental compliance.

Methodology

This includes different techniques such as physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. These studies cover various aspects of environment as mentioned in the report.

1.2. Synopsis

Water Management – Judicial usage of water is being maintained by the college administration and instructions were also given to the students. Rain water harvesting pits are dug in the campus for ground water recharge. RO plant service the drinking water requirement and bore water is used for other uses.

RO PLANT

Waste Management – Waste segregation at the source being practices by every department in the campus. Dry waste is sent to recycling units with the support of URBAN REBOX IT private LTD, an authorized agency of ITC .Though the wet waste segregation is being done and sent to compost units, it need to be streamlines for effective usage. The bins are placed as per the requirement.

MEMORANDUM OF UNDERSTANDING

This **Memorandum of Understanding** is made and executed **on 01st January' 2020** at **Hyderabad.**

BY AND BETWEEN

Mahaveer Institute of Science & Technology, Vyasapuri, Bandlaguda, Keshavagiri (P.O), Hyderabad-500005, its administrators, assigns and successors represented by Dr. Shankar Ram, Principal, who is duly authorized to sign and execute the MoU.

Being the First Part
AND

Urban Rebox IT Private Ltd, an authorized agency of ITC having its principal office situated at No. # 11-3-362/3, Mohammadguda, Secunderabad, Hyderabad-500061 and represented by Mr. D. Sai Krishna, Manager referred as **"Rebox"**

Being the Second Part

Whereas Mahaveer Institute of Science & Technology has agreed to collect and give away the dry recyclable waste including any kind of paper waste and old records generated in its college and form Swachh WOW Hyderabad Chapter.

1. **NOW THIS MOU WITNESSETH AS UNDER:**
   This is an agreement for a synergic alliance between Mahaveer Institute of Science & Technology, Vyasapuri, Bandlaguda, Keshavagiri (P.O), Hyderabad-500005 and Rebox for the social cause of recycling of Dry Waste and Environment Protection through recycling.

2. **Time period:** This MOU shall be for a period of one year commencing from the date of signing of this MOU.

3. **Roles and Responsibilities of Mahaveer Institute of Science & Technology:**

   1. To ensure source segregation of dry and wet waste at College premise through its Teaching staff, housekeeping staff and Students.
   2. Mahaveer Institute of Science & Technology will give away any kind of paper waste, dry recyclable waste and old records to Rebox at price agreed mutually. Rebox will pay Rs.8/kg for any kind of Paper waste and Old records/Dull white paper will pay Rs. 3/Kg, for metal scrap Rebox shall pay Rs. 9/Kg and for plastic waste Rebox will pay Rs. 4/Kg. For e-waste Rebox shall pay as per annexure – 1.
   3. Mahaveer Institute of Science & Technology shall form Swachh WOW Hyderabad Chapter in the college with Student Volunteers and adopt nearby Schools or Colonies to promote Source Segregation through student volunteers. MARI shall provide participation certificates to the students.

4. Mahaveer Institute of Science & Technology shall provide students for Internship in WOW Program. MARI shall provide internship certificate to the students.
5. Mahaveer Institute of Science & Technology shall motivate students to bring dry recyclables like paper, plastic, metal etc. from their home and donate to WOW initiative.
6. Mahaveer Institute of Science & Technology will put-up color-coded bins for waste segregation at different points in College premises.

4. Roles and Responsibilities of URBAN REBOX:

1. ITC-MARI will train the students and housekeeping staff on source segregation and through them inculcate the habit of source segregation among the other students.
2. Rebox will collect dry recyclable waste and old records from College and bring to the Dry Resource Collection Centre (DRCC) without any spillage.
3. Rebox will organize sorting of the dry waste into different categories, baling, and appropriate disposal of dry waste.
4. Rebox shall coordinate with ITC and undertake necessary measures for dispatch of the sorted recyclables for recycling at its own cost.
5. Rebox will make payment to Mahaveer Institute of Science & Technology directly into their accounts for the dry recyclable waste collected against the accurate weighment and the type or category of the dry waste. The payment shall be made no later than 15 days from the date of purchase of dry waste from the waste collector. Franchisee on the request of Mahaveer Institute of Science & Technology may give New Notebooks and Stationery against the value of dry recyclable waste lifted.

5. Performance of Obligations

1. The details laid out in this MOU, notwithstanding the essence and spirit of this MOU is an understanding between Mahaveer Institute of Science & Technology and Rebox.

2. Any notice or other communication under or in connection with this agreement shall be in writing in the English language and shall be delivered personally or sent by way of e-mail to the party due to receive the notice or communication at its address set out in this contract or such other address as either party may specify by notice in writing to other.

ADDRESS FOR COMMUNICATION:
Following are the address to which all notices shall be sent:

For URBAN REBOX:
Urban Rebox IT Pvt Ltd
H.No. #11-3-362/3,
Mohammadguda, Secunderabad,
Hyderabad - 500061
Phone No.9000479471
Email ID: urbanreboxit@gmail.com

For Mahaveer Institute of Science & Technology,
Vyasapuri, Bandlaguda, Keshavagiri (P.O),
Hyderabad-500005
Phone No:
Email ID:

6. Execution of this Agreement shall be deemed to be
   a) A confirmation by both the parties that no benefit, either in cash or kind has been provided by either party to the other party or to any officer or employee, or any relative/ associate of any officer or employee of either party or of any of their associate institutions/companies in order to enter into this Agreement, and
   b) An undertaking by both the parties not to provide any benefit, either in cash or kind to any officer/employee/relative/associate of any officer or employee of either party as reward or consideration either for entering into this MOU or other matter relating to this Agreement.

7. Other Terms:

Force Majeure: Neither party shall be liable for damages for any delay or failure to perform its obligations here under, if such delay or failure is due to reasons beyond the control of the concerned party including without limitation, strikes, riots, wars, fires, epidemics, quarantine restrictions, unusually severe weather, earth quakes, explosions, acts of God or state or any public enemy or acts mandated by applicable laws, regulation or order, whether valid or invalid, of any Governmental body.

8. **Dispute Resolution**: It is understood by both the parties that this Agreement is for a social cause and not to make any profit out of the understanding. The Parties covenant that they will comply with all applicable laws and regulations in their conduct pursuant to this Agreement. Any dispute arising out of this Agreement shall be first attempted to settle amicably between the parties.

9. **Arbitration**
Any dispute which is not resolved amicably shall be finally settled by binding arbitration in respect to the matters concerning to the MOU with the Sole Arbitrator to be appointed by the mutual consent of both the parties. The Parties agree that the decision or award resulting from arbitration shall be final and binding upon the Parties.

Pending the submission of and/or decision on a dispute, the Parties shall continue to perform their respective obligations under this Agreement without prejudice to a final adjustment in accordance with such arbitration award

10. **Governing and Jurisdiction**: This Agreement is subjected to the Jurisdiction of Courts at Hyderabad.
    - Both the parties shall agree that it will not make use of, disseminate, or in any way disclose any confidential information to any person, firm or business. Furthermore, the existence of any discussions, negotiations or agreements in progress between the parties shall not be released to any form of public media without written approval of both parties.

11. **Amendments**
This Agreement and the Schedules together constitute a complete and exclusive understanding of the terms of the Agreement between the Parties on the subject hereof and

no amendment or modification hereto shall be valid and effective unless agreed to by all the Parties hereto and evidenced in writing.

12. **NOTICE /Termination**
Any notice required to be given hereunder shall be given in writing at the address of each party set forth as below in this agreement or to such other address either party may substitute by written notice to the other. Either party may terminate this Agreement by giving 30 days written notice to the other party.

In witness whereof the parties hereto have signed this agreement on the day, month and year mentioned hereinbefore.

For Mahaveer Institute of Science & Technology

Principal
Mahaveer Institute of Science & Technology
Vyasapuri, Bandlaguda, Keshavagiri (P.O),
Hyderabad-500005

For URBAN REBOX

D Sai Krishna
Operations Manager

URBAN REBOX IT PVT.LTD. HYD

Witness:

1.

2.

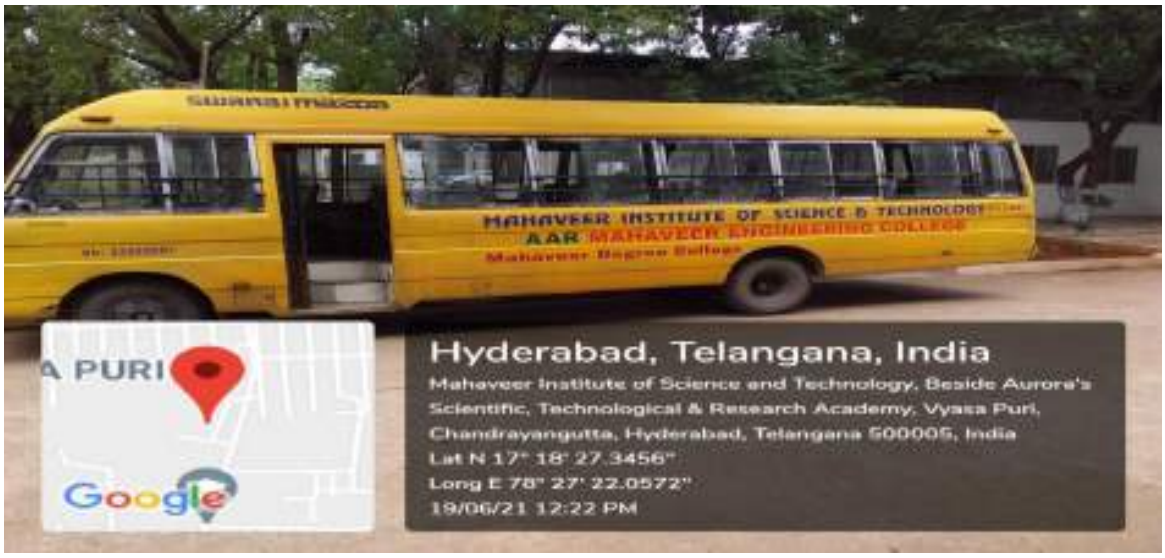
Annexure 1

Below are the items and rates listed:

Sl.no	Description	Price (Rs/Piece)
1.	**E-waste:**	
	CRT Monitors	50.00
	LCD/LED Monitors (working condition)	250.00
	LCD/LED Monitors (Non-working condition)	70.00
	CPU (working condition)	280.00
	CPU (non-working condition)	150.00
	Keyboard	7.00
	Mouse	1.00
	Dot Matrix Printer	60.00
	Laser Jet/ Desktop Printer	130.00
	Core/Dual core Laptop (non-working condition)	400.00
	i Processor Laptop (non-working condition)	500.00
	Core/Dual core Laptop (working condition)	900.00
	i Processor Laptop (working condition)	1500.00
	UPS	60.00
	Cables (per KG)	10.00
	SMPS	10.00
	Head Phones	6.00

URBAN REBOX IT PVT.LTD.
#11-3-362/3, MR Complex, Srinivas Nagar, Padmarao Nagar,
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

Transportation – Majority of the students use public transport creating less carbon footprint.College also provides bus facility for the students and faculty members.



TSRTC PUBLIC TRANSPORT COLLEGE BUS STOP

Students Awareness Campaigns – Various campaign activities are being initiated by college and run by the students. Activities based on water and energy conservation are being done in the college premises which is evident by the display stickers on good practices in the required places of every building. NSS students prepare their activities and conduct for mass awareness in and around the campus.

Infrastructure - Apart of the building and other facilities college administration has taken upeco-friendly initiative like

- RO Plant for safe drinking water
- Rainwater harvesting pits for ground water recharge
- College management planning to install Biogas plant for wet waste management
- MOU with ITC for safe disposal and recycle of paper waste plastic and E-waste
- Sanitary napkin burner installed in ladies toilets for safe disposal


GPS Map Camera
Hyderabad, Telangana, India
Mahaveer Institute of Science and Technology, beside Aurora's Scientific, Technological &
Research Academy, Vyasa Puri, Chandrayangutta, Hyderabad, Telangana 500005, India
Lat 17.308303°
Long 78.455689°
15/07/21 02:17 PM
SA PURI
Google
Arora Rd

RO PLANT

WATER HARVESTING PIT

MARI

WOW

Certificate of Appreciation

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Sincerely thank

MAHAVEER INSTITUTE OF SCIENCE AND TECHNOLOGY

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We look forward to your continued support in making India

SWACHH & GREEN

RECYCLE MORE & PROTECT ENVIRONMENT

Sib Sankar Bandyopadhyay

ISWA

Indian Biogas Association

SANITARY NAPKIN BURNER IN LADIES TOILETS

1.3. Recommendations

- Overall Environmental plan for strategic implementation of eco-friendly practices is to be framed every year. This help to streamline the existing good practices that are already being implemented. This also gives increase the scope of environmental activities for students. Strict implementation of the plan also brings behavior change amongst the students‟ fraternity.

- Environment auditing is to be carried out every year to evaluate the outcomes of the environmental activities. This helps the college to implement activities like cost efficiency and conservation of the available natural resources.

- Continuous check of the LED bulbs usage with the help of student team and proper maintenance of the solar power plant also increase the energy efficiency of the system.Proper maintenance and judicial use of electricity will reduce the energy consumption of the college.

- The old machinery like computers, printers, fans and other electronic appliances are to be repaired, maintained or changed regularly to reduce overall energy consumption.

- Rain water harvesting structures are to be built with proper scientific method for all buildings for water conservation within the campus. And students should take part in the conservation of water of the entire campus so that they also learn the system and good practices.

- Waste water from laboratories and canteens are to be controlled and used for garden only after proper treatment.

- Repair leaking taps and pipes at regular intervals to conserve water.

- Specific Waste Management Plan should be developed and adopted to manage solid waste within the campus. Swachh Survekshan of Swachh Bharat

  Mission is also now giving scope for the involvement of the college and general public inlarge. So college can take part in their programmes.

- Management has to make the campus plastic free zone. Usage of single use plastic is to be banned completely from the campus especially in the plastic bags, glasses, cups / plates. The manure of compost can be used for plants avoid using pesticides. Thereshould be a system for better management of hazardous waste management.

- Bio toilets can be installed for better management of fecal sludge.
- Vehicle pooling can be promoted for both students and faculty. Initially this can be declared by the management or through student groups on particular days.

- Environmental education should be part of curriculum and activities irrespective of the subjects. Students should be made part of environmental activities being organized in the campus.

- More display board should be set up on various conservation aspects.
- Students and faculty should be trained on carbon footprint calculation and reduce carbon emissions.
- Students are encouraged to do innovative activities at this level so that they feel motivated and think on eco-friendly solutions.

****

Chapter 2

ENERGY

Energy audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital production and utility activities. It will help to understand more about the ways energy utilized and help in identifying the areas where waste can occur and where scope for improvement exists.

Energy audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating and maintenance practices of a campus. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply decision on appropriate energy mix, decision on using improved energy conservation equipment, instrumentations and technology. It is proven that energy saving about 15 to 30% is possible by optimizing use of energy efficient equipment at the time of replacements.

MIST has come up with energy efficient technologies like installation and usage of LED Bulbs. They also have range of eco-friendly activities involving students of NSS.

2.1. Objectives

The main objectives of conducting energy audit are as follows:

- To study the present pattern of energy consumption
- To identify potential areas for energy optimization
- To recommend energy conservation proposals with cost benefit analysis

Energy Source within the campus

Institute uses energy from:

- A 100 KW Solar power plant is installed in the college.
- Electricity from TSSPDCL

The following are the electrical appliances college use regularly for various purposes:

A view of MIST 100kW solar power plant

Connected Load					
Old Building Connected Load					
S. No	**Location**	**Description (Items)**	**Quantity (Nos)**	**Rating (W)**	**Total (KW)**
1	Building 1 (Old Building)	Split ACs (1.5Ton)	43	1725	74.2
		Fans	294	80	23.52
		Tubes Lights (4')	270	40	10.8
		Tubes Lights (2')	1000	20	20
		Computers with Monitors	1040	250	260
		UPSs	14	6KVA&10KVA	112
		OHPs	21	125	2.63
		Lab Equipment	All Labs	Different	120.75
		Other Loads (Oven , Fridge, etc)	Different	Different	2
Total Load in KW					**625.9**

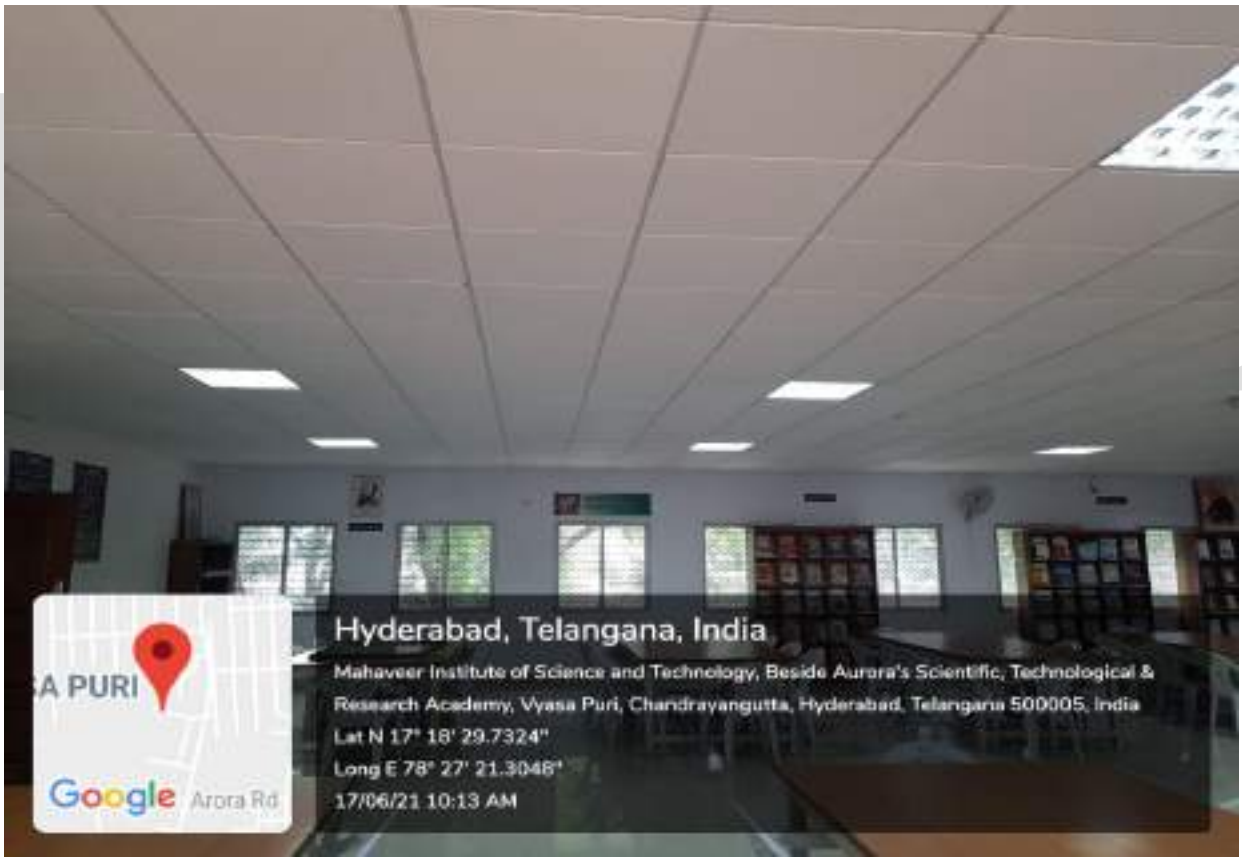
NEW Building-Connected Load					
S. No	**Location**	**Description (Items)**	**Quantity (Nos)**	**Rating (W)**	**Total (KW)**
1	Building 2 (New Building)	Split ACs (1.5Ton)	0		0
		Fans	203	80	16.24
		Tubes Lights (4')	155	40	6.2
		Computers with Monitors	37	250	9.25
		UPSs	1	6KVA&10KVA	6
		OHPs	11	125	1.38
		Lab Equipment	All Labs	Different	130.55
		Other Loads (Hot air Oven, etc)	Different	Different	2.5
Total Load In KW					**172.115**

MG Set Rating		
S. No	**Rating (KVA)**	**Total (KW)**
1	125	125 (Runing)
2	160	160 (Spare)
Total in KW		**285**

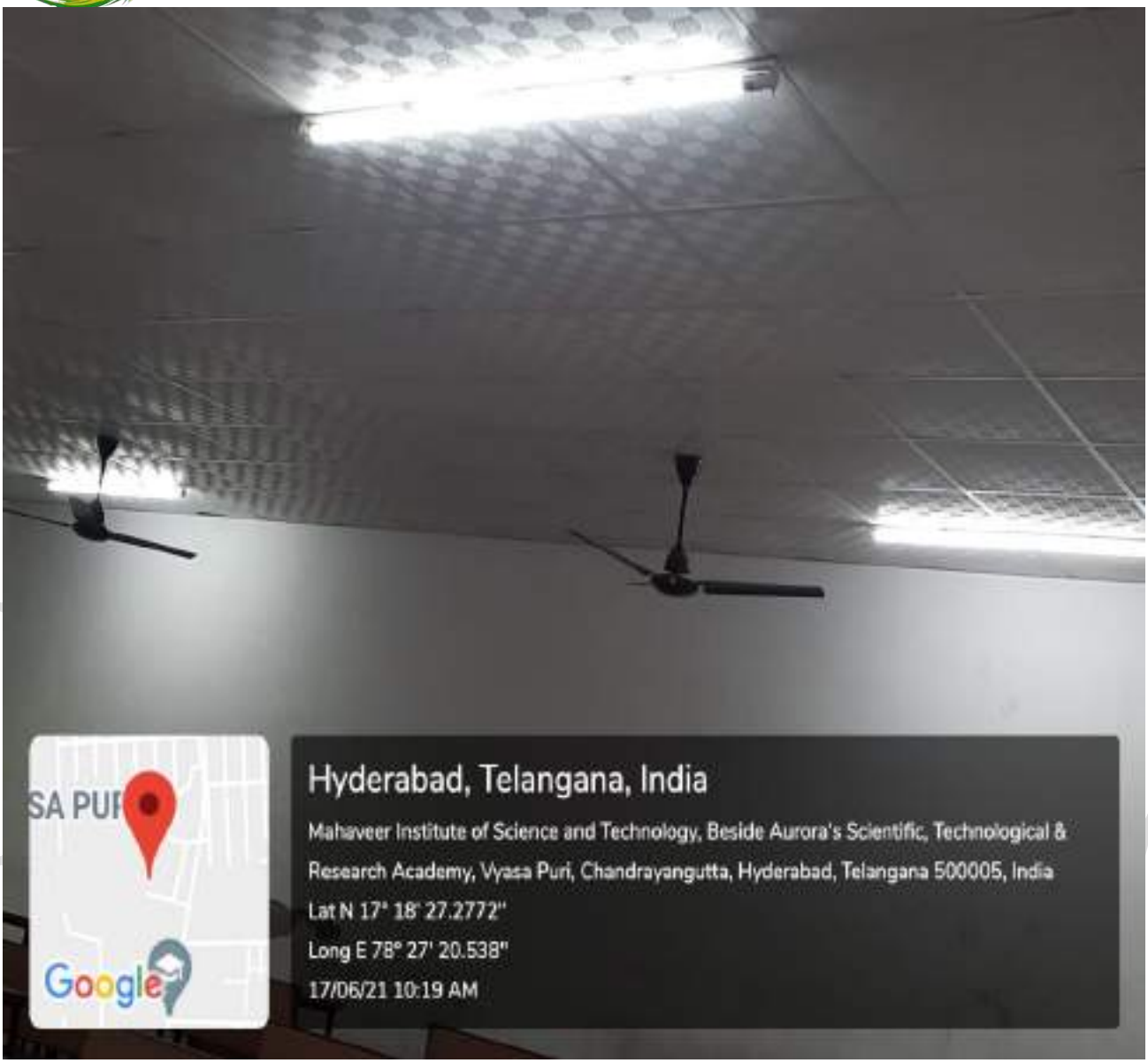
2.2. Annual Power saving through LED Bulbs

Total requirements	Coverage (%) through LED Bulbs	Coverage (%) through other sources
73488W	16816W(29.672%)	56672W(70.327%)

Energy saving through the replacement of LED bulbs was a good option. Apart from this awareness programmes organized by NGC and NSS students has also been instrumental in reduced energy consumption.



LED BULBS INSTALLED IN LIBRARY



LED BULBS INSTALLED IN CLASS ROOM

2.3. Transportation

The college transportation includes wide variety of vehicles including the buses provided by thecollege. The following are the details:

No. of buses	11
No. of students bus transport	300
No. of students using public transport	850
No. of faculty using public transport	nil
No. of faculty own vehicles	40
No. of students own vehicles	200
No. of buses having pollution certificate	11
No. of outside vehicles visited in the year	~1200
Fuel consumption in litres/Year	27500 lts

Institute utilizes11 buses as public transport facility to the students and faculty. This has reduced pressure on the fuel usages for various other vehicles. And also about 60.71 % of the total strength including students & faculty are using public transport. Further about 21.42% students use college bus facility.

Chapter -3

WATER

Virtually everything we do or use each day involves water. Yet, we do not give it the importance that is due to it. India will soon be a water-stressed country and we all need to worktowards our water security. As our populations continue to grow and shift, the availability of quality water resources is in decline. Pollution, climate change and construction of cities in dry regions are some of the factors exacerbating evolving supply/ demand imbalances. To account this, it is essential that man utilize existing water resources in the most careful, efficient manner. Water audits provide a rational, scientific framework that categorizes all water use. It is a tool to overcome drought related problem, shortage, leakage and losses.

Simple actions can be adopted to reduce the wastage of water and use it wisely. Water audit is aqualitative and quantitative analysis of water consumption to identify means of Reducing, Reusing and Recycling of water. Water consumption patterns are to be identified and problems are to be fixed like leaks & overflow, identify the points where water loss is observed, identify the solutions, assign the responsibility for implementation, prepare a monitoring schedule and assign a person for monitoring.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the activities for water treatment and reuse. The relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible institution examine its water use practices.

3.1. Sources of water

The water source is bore well only. The campus has Overhead tanks for each building along with bore well. For drinking water RO plant is set up.

RO PLANT

3.2. Water Consumption

S.NO	Location	Length of Tank (L)(m)	Width of Tank (B)(m)	Height of Tank (H)(m)	Volume of Tank (V)(m^3)	Vol.of Tank (Liters)	Total Vol.Of Water utilized
1	Main block A	17.9	13.4	4.10	2784 75	27847.52	13,923.75
2	Main block B	17.1	13.6	4.10	2700 0	27000	13,500
3	New Block A	-	-	-	-	1000	500
4	New Block B	-	-	-	-	1000	500
MIST Water Consumption						**56,847.52**	**28,423.75**


GPS Map Camera
Hyderabad, Telangana, India
Mahaveer Institute of Science and Technology, beside Aurora's Scientific, Technological &
Research Academy, Vyasa Puri, Chandrayangutta, Hyderabad, Telangana 500005, India
Lat 17.308395°
Long 78.455437°
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Google

WATER TANKS

3.3 WATER ANALYSIS REPORT done by in environmental engineering lab of MIST

Parameter/ WHO permissible level	Observed Value		Methodology
	Sample 1 drinking water	Sample2 Bore well water	
colour	Colour less	Colour less	
pH/6.5-6.8	**6.3**	**6.6**	**pH meter**
Turbidity /5-10NTU	**4**		**Turnidity meter**
Conductance/0.4mS cm-1	**15.7**	**8.26**	**Conductivity meter**
Fe/0.30ppm	**0.24**	**0.26**	**spectroscopy**
Na/200ppm	**246**	**220**	**Flame photometer**
k/12 ppm	**11**	**14**	**Flame photmeter**
Mg/30 ppm	**40**	**42**	**Titrimeteric**
Ca/75 ppm	**72**	**81**	**Titrimeteric**
F-/1.5 ppm	**0.3**	**0.5**	**Titrimeteric**
Cl-/250 ppm	**8.2**	**20.63**	**Titrimeteric**
NO3-/ 50 ppm	**40**	**43**	**spectroscopy**
SO4/250 ppm	**248**	**260**	**Turbidity meter**

Sample 1:– Drinking Water

Sample 2:– Bore well water

3.3. RO Plant

- RO plant installed for ensuring safe drinking water for students and faculty
- The liquid waste generated by drinking water RO Plant is used for gardening

RO PLANT

3.4 Rain Water Harvesting Structure:

MIST takes the necessary measures to collect and reuses rain water. Surface runoff collected from the roads and open ground is allowed to flow through proper channels and then allowed to infiltrate into the ground to recharge ground water. Rain water is collected from the roofs of building through PVC pipes and then allowed to sell designed rain water structures. Rain water harvesting pits are properly designed and constructed to recharge the aquifers. Each recharge pit has size of 4ft X 4 ft X 6 ft and depth of each pit from the bottom consists of 1.5 ft gravel/pebbles, 1.5 ft coarse sand and 2 ft left for water collection.

RAIN WATER HARVESTING PIT

Chapter - 4

4 : WASTE MANAGEMENT

4.1. About Waste Audit

The purpose of the waste audit is to gain a detailed understanding of the types and weights of material being generated. The recommendations can be used to improve the economic and environmental performance of waste management efforts. For this audit, there is a need to discover the waste being generated and material are recyclables. Further the dispose mechanism adopted for both wet and dry waste has to be considered during audit. An effective waste reduction program must be based on current and accurate information on the quantity and composition of the waste stream. Therefore, there should be systematic procedure to review operations and subsequently, waste generation. Performing this exercise will define the composition of your discards by examining how materials enter and exit your facility.

All operations produce waste and there is nothing wrong by recognizing it. However today concern is over waste generation and increasing costs of collection and disposal are good reasons to find out how to reduce, increase recycling and try to cut costs. An audit alone will not reduce your waste. Rather, it is the starting point that will enable your work to make informed decisions on how to allocate resources for source reduction and recycling programs.

In long run this saves money, reduces waste and disposal costs and creates positive environment campus image. This also helps in devising the ways and methods of reducing wastes at the source.

Hazardous Waste – Institute adopts standard operating procedures for safe disposal of hazardous chemicals collected in the chemistry laboratory and other allied departments. The chemicals like acids utilized for experiments are very negligible hazardous chemicals.

4.2. Waste classification & Quantity

MIST has following solid waste management:

- Waste collection bins are placed in the classrooms, canteen and in the college hostels to collect the solid waste materials like cool drink cans/ bottles, paper etc
- Around 80 Kg/day organic waste is being generated from the canteen.
- Planning install Bio gas plant near college canteen to utilize food waste generated.
- Waste Material from the construction of building, such as cement, brick pieces, gravel, sand etc are collected and reused for land filling and other small constructions in the college.
- College Management has banned the usage of plastic bottles in the campus.

SNo	Source	Types of Waste	Quantity of waste produced per year
1	Canteen	Food	220 Kgs
		Plastic	500Kg
2	Labs, Classrooms, administrative office	Books, papers	17 tons
3	Labs	E-Waste	28 Kgs
4	Construction Site	Construction Waste	950 Kgs
5	Garden	Horticulture	65 Kgs
6	Garden & Campus	Rubbish	3600 Kgs
7	Washrooms	Sanitary	450 Kgs
8	Chemistry Labs	Chemical Waste	8 Kgs

Source	Type of waste	Description
Canteen	Food	Waste obtained as result of preparation, cooking and serving of food, waste produced due to handling market refuse.college management is planning to install Bio-gas plant near canteen.
	Plastic	The plastic waste consists of used water bottles, broken chairs, milkshake tins etc. These are collected every day in the evening and are stored and sent torecycling unit with thesupport of Urban Rebox IT private Ltd, agency of ITC.
Labs, classrooms, administrative office	Books & Other papers	Books, newspapers, record etc are collected at the end of each semester and sent to recycling unit. Similarly the exampapers, sheets are collected and recycled every year.
Labs	E-Waste	Mainly consists of chips, electronic material etc. These materials are also sent to recycling unit with the support of Urban Rebox IT private Ltd, agency of ITC.
ConstructionSite	Construction Waste	Consists of the waste produced during construction or repairs of the blocks. It consists of cement, card board, wood, iron material etc
Garden	Horticulture	Consists of twigs, dry leaves, flowers & fruits fallen from theplants etc
Garden & Campus	Rubbish	It includes two types of waste 1. Combustible (primarily organic), paper card boards, cartons, wood, leather, grass, leaves etc 2. Non-combustible (primarily inorganic)-metals,stones and grass etc
Washrooms	Sanitary	It consists of sanitary waste like pads, college management has installed sanitary napkin burner.
ChemistryLabs	Chemical Waste	The chemical waste mainly consist of chemicals that are used in laboratory and the chemicals which are expired cannot be used further

4.3. Collection & Storage of waste

The Wet waste is being sent to compost unit and resulted manure is used for plants in the campus. And the dry waste is collected separately item wise and sent to recycling unit with the support of Urban Rebox IT private Ltd, agency of ITC.. Initially they the stored at safe place within the campus and then collected by Urban Rebox IT private Ltd, agency of ITC. monthly once depending on the quantity of the material. Twin bins are installed at required places and for wet waste two types of compost units are being maintained.College management is planning to install a Biogas plant near the canteen to utilize organic waste like food waste and animal dung. The exhaust of the biogas plant can be used a manure for the plants.

COLLECTING DRY AND WET BINS

4.4. E-Waste Management

- Computers and their parts, telephones, printers and other electronic devices becomeobsolete or do not function properly after some years are considered to be e- waste.
- Proper collection and disposal of e-waste is very important as they are mostly made ofhazardous metals like lead, cadmium etc.
- All the E-Waste like key boards, mother boards, printers etc generated in the collegepremises is stored in a separate room.
- Institute has MoU Urban Rebox IT private Ltd, agency of ITC., for the safe disposal of E-Waste.
- Urban Rebox IT private Ltd, agency of ITC.The E-Waste periodically.
- The printer cartridges are refilled outside the college.

E-WASTE CARRYING VEHICLE OF URBAN REBOX IT Pvt.Ltd

NOISE LEVEL:

The college is very quiet and no noise pollution is seen. The maximum observed noise level is between 55-77dB in most of the places and times 80 to 85dB near some of machines in Lab. Noise levels are well within limits.

Note:
As per the Factories Act 1948 Permissible Exposures in cases of continuous Noise is 90bBA is to be permitted.

SOLAR POWER:

A 100kWp Solar power plant is established to reduce dependency on Grid power which is predominantly fossil fuel based. Green Energy Percentage is about 50%.

College is already using a Solar powered UPS and Solar Street Lights.

WASTE PAPER STORE ROOM

E-WASTE STORE ROOM

E-WASTE STORE ROOM

E-WASTE CARRYING VEHICLE OF URBAN REBOX IT Pvt.Ltd

E-WASTE CARRYING VEHICLE OF URBAN REBOX IT Pvt.Ltd

Conclusion

- The overall environment of the college campus is being safe guarded with various activities. The utilization of the renewable resources is being done through Solar Power Plant and less energy consumption through LED Bulbs. RO plant is installed to ensure safe drinking water to students and faculty
- Waste Management is also effectively managed through safe disposal systems of wet and dry waste. Especially recycling of e-waste, plastic waste and safe disposal of sanitary napkins etc. Apart from the implementation of the above, the college management has also been very keen on involving students continuously in creating awareness through several activities by NSS Club.Dry waste and E-Waste is sent to recycling units with the support of URBAN REBOX IT private LTD, an authorized agency of ITC.
- College management is planning to install Biogas plant for effective utilization of food waste generated in the college canteen
- College management has installed sanitary napkin burners for safe disposal of sanitary napkins
- Rainwater harvesting pits are dug for improving ground water levels.

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For Peepal Waste Managers

Partner

PRINCIPAL
MAHAVEER
INSTITUTE OF SCIENCE & TECHNOLOGY
Kachiguda, Hyd-500 005

ISWA

ENVIRONMENT AUDIT REPORT

2021-2022

For Peepal Waste Managers

Partner

PRINCIPAL
MALLAREDDY
INSTITUTE OF SCIENCE & TECHNOLOGY
Suraram, Hyd-500 055

ISWA

PeepalWasteManagers,16-2-705/28,AndhraColony,Malakpet,Hyderabad-500036,India.
Phone:040-66663111,+91-9032029234 website:www.peepalwastemanagers.com

PREFACE

A healthy environment serves effective learning and provides a conducive learning environment. There are various efforts to address environmental education issues. The environmental monitoring system helps all the institution to set environmental examples for the community and to educate young learners to protect, manage and minimize the damage to environment, environmental education is necessary. It develops the required skills and expertise to handle the associated challenges. Such environment education to students is to impart knowledge, create awareness and provide skill to handle the environmental challenges.

MAHAVEER Institute of Science & Technology is determined to inculcate the emerging innovative generation and make them "Nurturing Future Leaders" with the continuous rise in expectation of essential leadership standards. The college has always strived to build such attitude towards environment amongst the students.

In view of the above, MAHVEER Institute of Science & Technology has intended to conduct the environment report of their campus to understand the present practices of sustainability with regard to various components of environment.

CERTIFICATE

This is to certify that we have carried out Environment Audit in the M/s. Mahaveer Institute of Science and Technology, Vysapuri, Bandlaguda, Hyderabad, Telangana during 25 December 2021 and following observations presented below. The Management is proactive in maintaining conducive environmental taking initiatives by harnessing Solar Energy, by Planting Trees, through better water conservation, by effective Waste Management, Carbon foot print. We appreciate. The efforts of the M/s Mahaveer institute of science and Technology, Vysapuri, Bandlaguda, Hyderabad, Telangana in this regard.

For Peepal Waste Managers

Partner

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Phone:040-66663111,+91-9032029234 website:www.peepalwastemanagers.com

TABLE OF CONTENTS

Chapter – 1

Introduction

Mahaveer Institute of Engineering & Technology is sponsored by the Mahaveer Educational Society, which was established in 2001. The college is situated 3Km away from chandrayangutta Road, Telangana, India. It is located in 7.19 acres of serene, lush green and pollution free area. The Management is committed in assuring quality service to all its stake holders such as parents, students, alumni, employees and the community. Commitment and dedication is executed into our policy of continual quality improvement by establishing and implementing mechanisms and modalities, ensuring accountability at all levels, transparency in procedures and access to information and services.

MIST has adopted the best possible steps for managing the degradable and non- degradable waste. Management of degradable and non-degradable waste refers to collection, proper treatment and safe disposal. Risk and threats associated with waste disposals can be easily evaded by the knowledge on forms of wastes.

MIST has taken initiatives to segregate the waste at its source level which is the first and most important step in waste management. Waste generated in the campus is recycled and reused to the maximum extent. For this, all the housekeeping staff members are properly trained to segregate waste at its source level before the waste is dumped for proper disposal. The various forms of waste generated in the college campus are kitchen waste (organic), food waste, paper waste, E-waste, dry waste (leaves) and liquid waste, sewage, biomedical waste such as sanitary napkins, and few less hazardous chemicals from chemistry laboratory etc. Sanitary napkin burners are installed in ladies toilets for safe disposal of sanitary napkin pads.

MIST practices the composting technique for organic waste. The waste that is generated from the canteen i.e., vegetable peels and animal dung

are mostly sent out to Biogas plant installed at college canteen for cooking gas generation and waste slurry is utilized as manure for plants. Color coded waste collection bins are placed in the college premises to collect solid waste. All the dry waste such as paper waste, old record etc and E-Waste like key boards, mother boards, printers, etc generated in the college will be collected by URBAN REBOX IT private Ltd, an authorized agency of ITC and undertake necessary measures for dispatch of the sorted recyclables for recycling as part of Swatch initiative.

The adopted methods of waste management help the college in attaining a high level of performance with respect to the environmental safety. The practices used in the waste- management are eco-friendly, economically viable and as per legal & regulatory norms.

1.1 College Map

Total area of the campus – 7.19acres

Total Built in area of the campus – 6 acres

1.1. Introduction to Environmental Audit

Environmental audit is a systematic, documented, periodic and objective review by regular entities of facility operations and practices related to meeting environmental requirements. In other words, it is a management tool comprising systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of helping to safeguard the environment by facilitating management control of practices and assessing compliance with company policies, which would include regulatory requirements and standards applicable.

Environmental auditing is essentially an environmental management tool for measuring the effects of certain activities on the environment against set criteria or standards. Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organization of all kinds recognizes the importance of environmental matters. The environmental performance will be scrutinized by a wide range of interested parties. Thus it helps to improve the existing human activities, with the aim of reducing the adverse effects of these activities on the environment. An environmental auditor will study an organizations environmental effect in a systematic and documented manner and will produce an environmental report.

Objectives

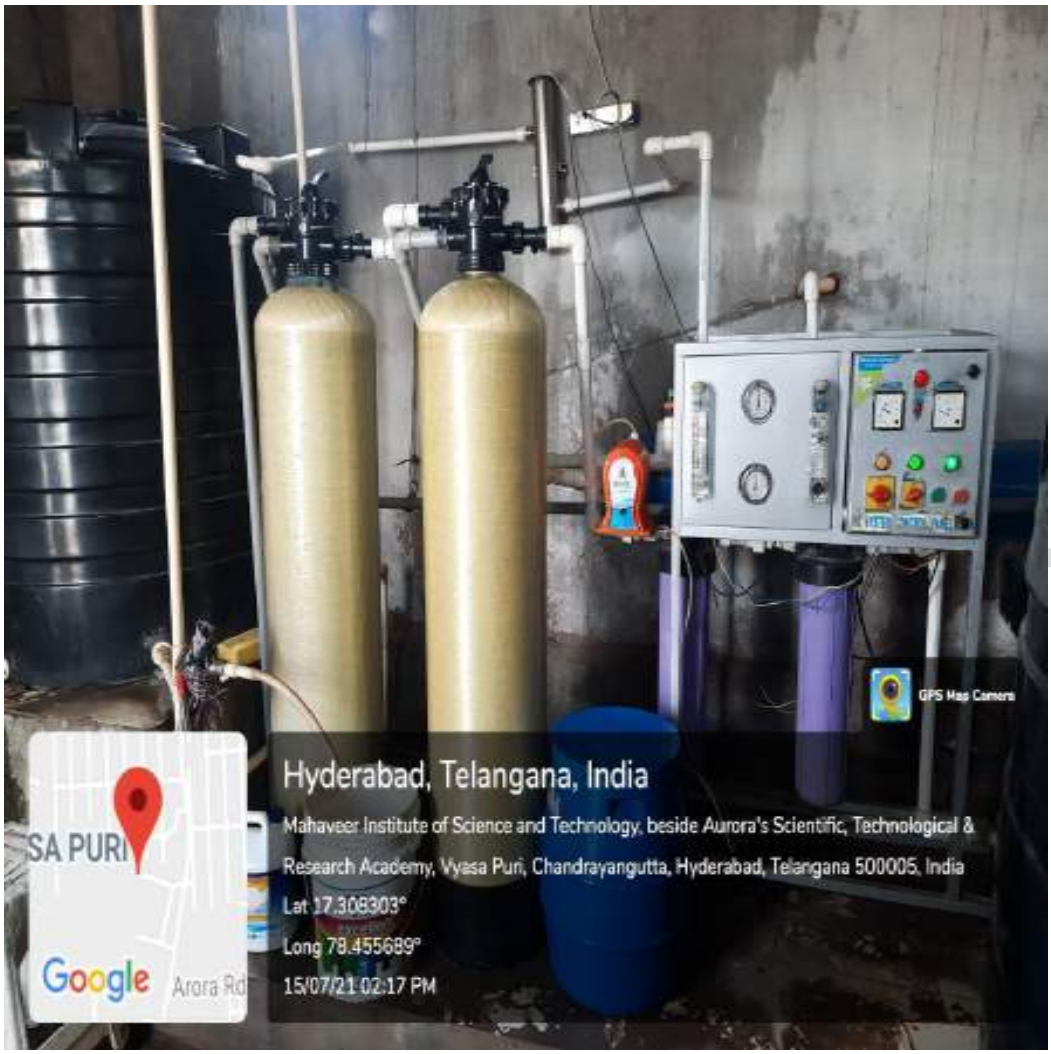
- To introduce and give awareness to the students to real concerns of environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- To bring out a present status report on environmental compliance.

Methodology

This includes different techniques such as physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. These studies cover various aspects of environment as mentioned in the report.

1.2. Synopsis

Water Management – Judicial usage of water is being maintained by the college administration and instructions were also given to the students. Rain water harvesting pits are dug in the campus for ground water recharge. RO plant service the drinking water requirement and bore water is used for other uses.

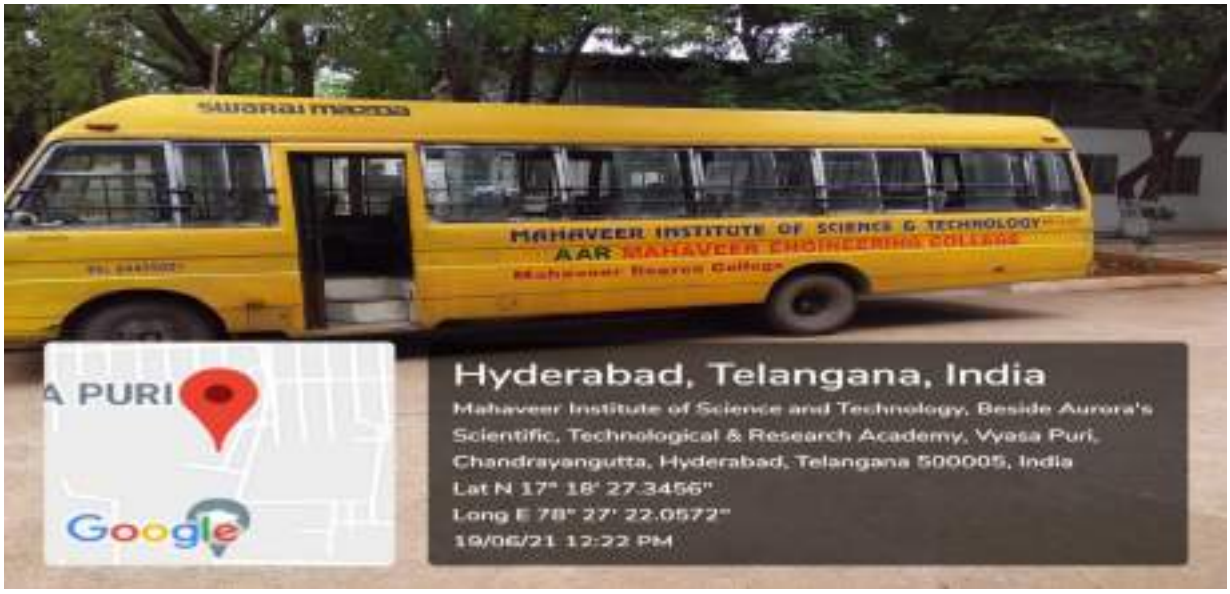


RO PLANT

Waste Management – Waste segregation at the source being practices by every department in the campus. Dry waste is sent to recycling units with the support of URBAN REBOX IT private LTD, an authorized agency of ITC .Though the wet waste segregation is being done and sent to compost units, it need to be streamlines for effective usage. The bins are placed as per the requirement.

- MOU with URBAN REBOX IT private LTD, an authorized agency of ITC.
- Biogas plant.
- Sanitary napkin burner.

Transportation – Majority of the students use public transport creating less carbon footprint. College also provides bus facility for the students and faculty members.



TSRTC PUBLIC TRANSPORT COLLEGE BUS STOP

Students Awareness Campaigns – Various campaign activities are being initiated by college and run by the students. Activities based on water and energy conservation are being done in the college premises which is evident by the display stickers on good practices in the required places of every building. NSS students prepare their activities and conduct for mass awareness in and around the campus.

Infrastructure - Apart of the building and other facilities college administration has taken up eco-friendly initiative like

- RO Plant for safe drinking water
- Rainwater harvesting pits for ground water recharge
- Biogas plant for wet waste management
- MOU with ITC for safe disposal and recycle of paper waste plastic and E-waste
- Sanitary napkin burner install in ladies toilets for safe disposal


GPS Map Camera
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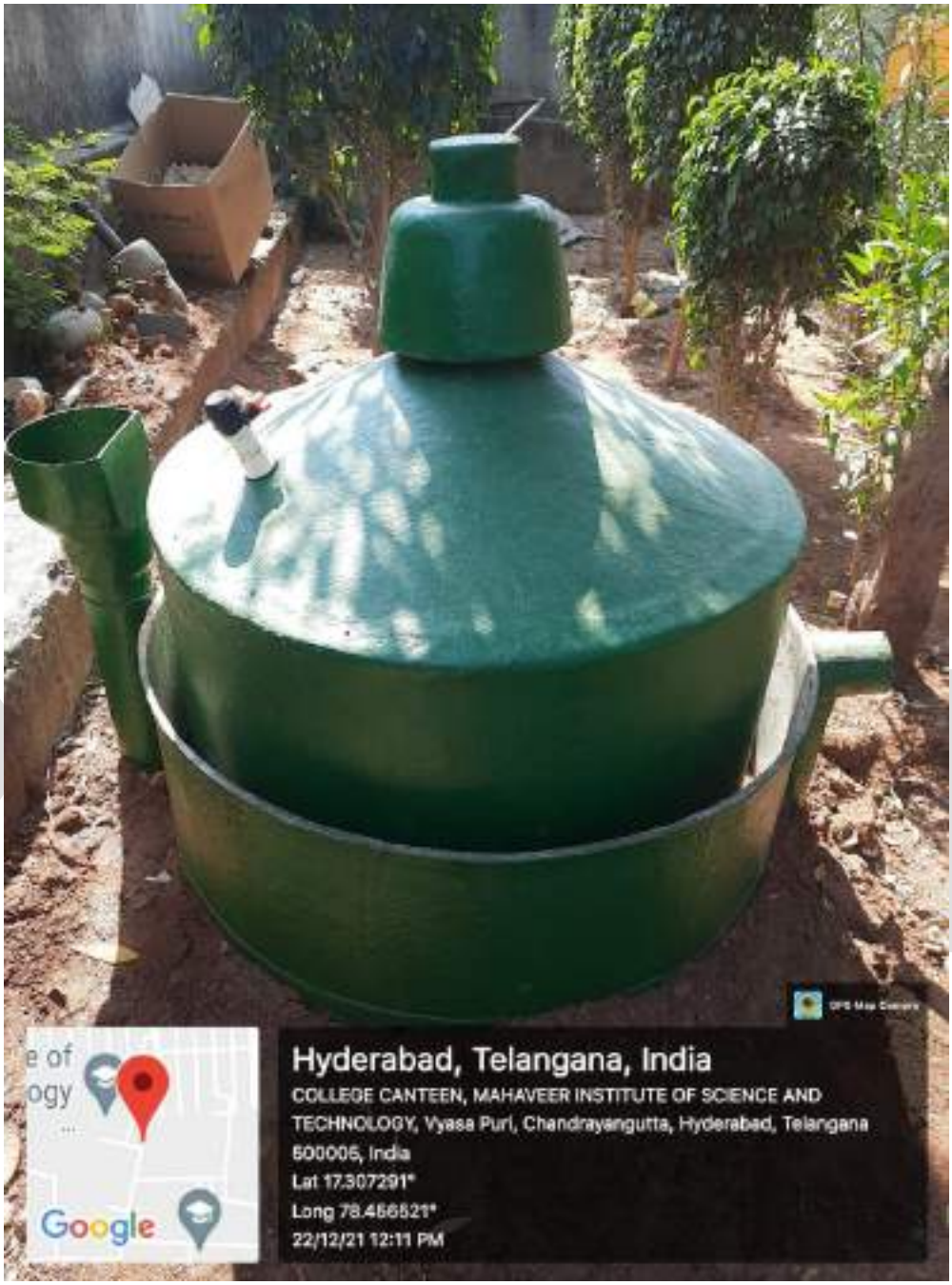
RO PLANT

WATER HARVESTING PIT



Bio GAS PLANT

SANITARY NAPKIN BURNER IN LADIES TOILET

1.3. Recommendations

- Overall Environmental plan for strategic implementation of eco-friendly practices is to be framed every year. This help to streamline the existing good practices that are already being implemented. This also gives increase the scope of environmental activities for students. Strict implementation of the plan also brings behavior change amongst the students‟ fraternity.

- Environment auditing is to be carried out every year to evaluate the outcomes of the environmental activities. This helps the college to implement activities like cost efficiency and conservation of the available natural resources.

- Continuous check of the LED bulbs usage with the help of student team and proper maintenance of the solar power plant also increase the energy efficiency of the system. Proper maintenance and judicial use of electricity will reduce the energy consumption of the college.

- The old machinery like computers, printers, fans and other electronic appliances are to be repaired, maintained or changed regularly to reduce overall energy consumption.

- Rain water harvesting structures are to be built with proper scientific method for all buildings for water conservation within the campus. And students should take part in the conservation of water of the entire campus so that they also learn the system and good practices.

- Waste water from laboratories and canteens are to be controlled and used for garden only after proper treatment.

- Repair leaking taps and pipes at regular intervals to conserve water.

- Specific Waste Management Plan should be developed and adopted to manage solid waste within the campus. Swachh Survekshan of Swachh Bharat

- Mission is also now giving scope for the involvement of the college and general public in large. So college can take part in their programmes.

- Management has to make the campus plastic free zone. Usage of single use plastic is to be banned completely from the campus especially in the plastic bags, glasses, cups plates. The manure of compost can be used for plants avoid using pesticides. There should be a system for better management of hazardous waste management.

- Bio toilets can be installed for better management of fecal sludge.

- Vehicle pooling can be promoted for both students and faculty. Initially this can be declared by the management or through student groups on particulardays.

- Environmental education should be part of curriculum and activities irrespective of the subjects. Students should be made part of environmental activities being organized in the campus.

- More display board should be set up on various conservation aspects.

- Students and faculty should be trained on carbon footprint calculation and reduce carbon emissions.

- Students are encouraged to do innovative activities at this level so that they feel motivated and think on eco-friendly solutions.

****

Chapter 2

ENERGY

Energy audit would give a positive orientation to the energy cost reduction, preventive maintenance and quality control programmes which are vital production and utility activities. It will help to understand more about the ways energy utilized and help in identifying the areas where waste can occur and where scope for improvement exists.

Energy audit helps in energy cost optimization, pollution control, safety aspects and suggests the methods to improve the operating and maintenance practices of a campus. It is instrumental in coping with the situation of variation in energy cost availability, reliability of energy supply decision on appropriate energy mix, decision on using improved energy conservation equipment, instrumentations and technology. It is proven that energy saving about 15 to 30% is possible by optimizing use of energy efficient equipment at the time of replacements.

MIST has come up with energy efficient technologies like installation and usage of LED Bulbs. They also have range of eco-friendly activities involving students of NSS.

2.1. Objectives

The main objectives of conducting energy audit are as follows:

- To study the present pattern of energy consumption
- To identify potential areas for energy optimization
- To recommend energy conservation proposals with cost benefit analysis

Energy Source within the campus

Institute uses energy from:

- 100 KW Solar power plant installed in the campus.
- Electricity from TSSPDCL

The following are the electrical appliances college use regularly for various purposes:

A view of MIST 100kW solar power plant

Connected Load					
Old Building Connected Load					
S. No	**Location**	**Description (Items)**	**Quantity (No's)**	**Rating (W)**	**Total (KW)**
1	Building 1 (Old Building)	Split ACs (1.5Ton)	43	1725	74.2
		Fans	294	80	23.52
		Tubes Lights (4')	270	40	10.8
		Tubes Lights (2')	1000	20	20
		Computers with Monitors	1040	250	260
		UPSs	14	6KVA&10KVA	112
		OHPs	21	125	2.63
		Lab Equipment	All Labs	Different	120.75
		Other Loads (Oven , Fridge, etc)	Different	Different	2
Total Load in KW					**625.9**

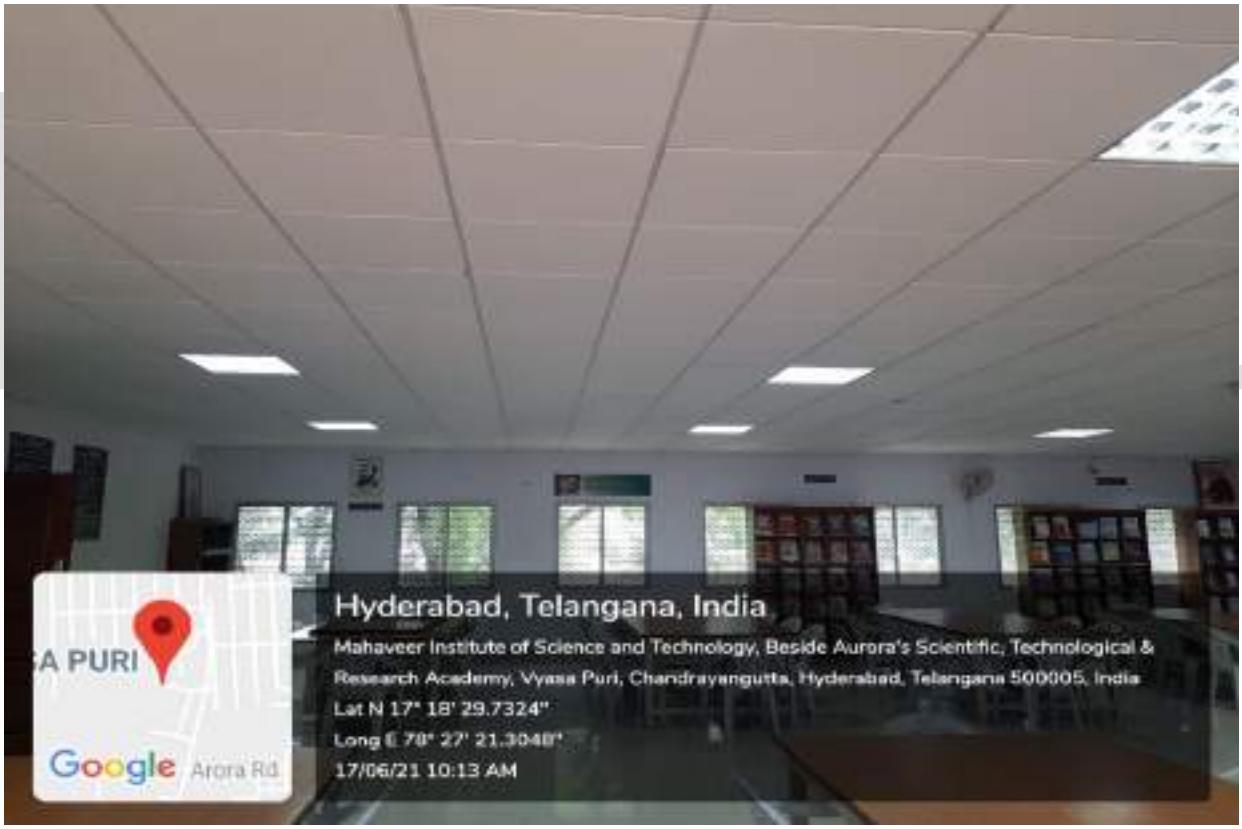
NEW Building-Connected Load					
S. No	**Location**	**Description (Items)**	**Quantity (No's)**	**Rating (W)**	**Total (KW)**
1	Building 2 (New Building)	Split ACs (1.5Ton)	0		0
		Fans	203	80	16.24
		Tubes Lights (4')	155	40	6.2
		Computers with Monitors	37	250	9.25
		UPSs	1	6KVA&10KVA	6
		OHPs	11	125	1.38
		Lab Equipment	All Labs	Different	130.55
		Other Loads (Hot air Oven, etc)	Different	Different	2.5
Total Load In KW					**172.115**

MG Set Rating		
S. No	**Rating (KVA)**	**Total (KW)**
1	125	125 (Runing)
2	160	160 (Spare)
Total in KW		**285**

2.2. Annual Power saving through LED Bulbs

Total requirements	Coverage (%) through LED Bulbs	Coverage (%) through other sources
68,728W	20,056W(41.20%)	48,672W(58.80%)

Energy saving through the replacement of LED bulbs was a good option. Apart from this awareness programmes organized by NGC and NSS students has also been instrumental in reduced energy consumption.



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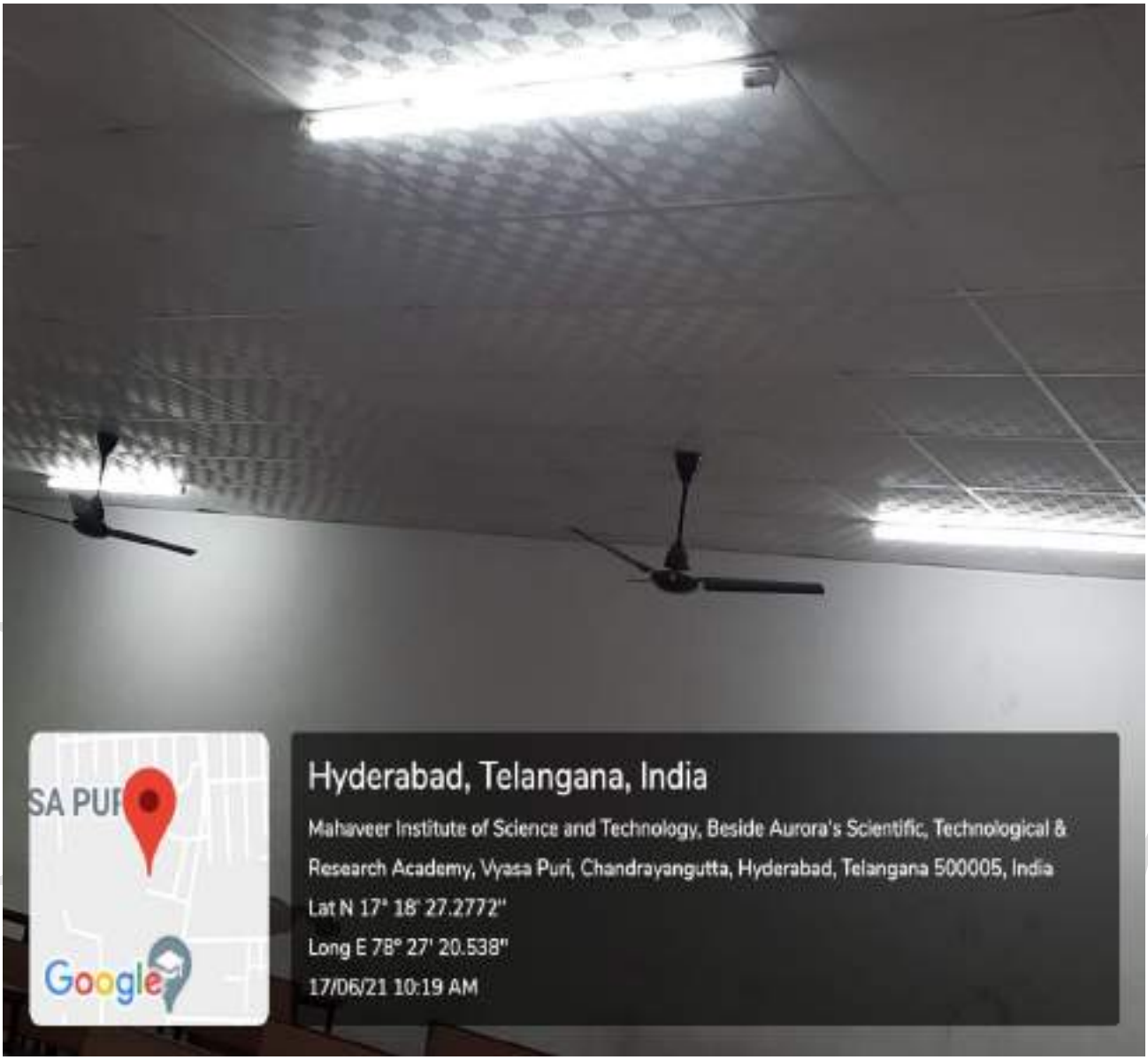

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No. of buses having pollution certificate	11
No. of outside vehicles visited in the year	~1200
Fuel consumption in litres/Year	27500 lts

Institute utilizes11 buses as public transport facility to the students and faculty. This has reduced pressure on the fuel usages for various other vehicles. And also about 60.71 % of the total strength including students & faculty are using public transport. Further about 21.42% students use college bus facility.

Chapter -3

WATER

Virtually everything we do or use each day involves water. Yet, we do not give it the importance that is due to it. India will soon be a water-stressed country and we all need to work towards our water security. As our populations continue to grow and shift, the availability of quality water resources is in decline. Pollution, climate change and construction of cities in dry regions are some of the factors exacerbating evolving supply/ demand imbalances. To account this, it is essential that man utilize existing water resources in the most careful, efficient manner. Water audits provide a rational, scientific framework that categorizes all water use. It is a tool to overcome drought related problem, shortage, leakage and losses.

Simple actions can be adopted to reduce the wastage of water and use it wisely. Water audit is a qualitative and quantitative analysis of water consumption to identify means of Reducing, Reusing and Recycling of water. Water consumption patterns are to be identified and problems are to be fixed like leaks & overflow, identify the points where water loss is observed, identify the solutions, assign the responsibility for implementation, prepare a monitoring schedule and assign a person for monitoring.

Water auditing is conducted for the evaluation of facilities of raw water intake and determining the activities for water treatment and reuse. The relevant method that can be adopted and implemented to balance the demand and supply of water. It is therefore essential that any environmentally responsible institution examine its water use practices.

3.1. Sources of water

The water source is bore well only. The campus has Overhead tanks for each building along with bore well. For drinking water RO plant is set up.

RO PLANT

3.2. Water Consumption

S.NO	Location	Length of Tank (L)(m)	Width of Tank (B)(m)	Height of Tank (H)(m)	Volume of Tank (V)(m^3)	Vol.of Tank (Liters)
1	Main block A	17.9	13.4	4.10	278475	27847.52
2	Main block B	17.1	13.6	4.10	27000	27000
3	New Block A	-	-	-	-	1000
4	New Block B	-	-	-	-	1000
MIST Water Consumption						**56,847.52**


GPS Map Camera
Hyderabad, Telangana, India
Mahaveer Institute of Science and Technology, beside Aurora's Scientific, Technological & Research Academy, Vyasa Puri, Chandrayangutta, Hyderabad, Telangana 500005, India
Lat 17.308395°
Long 78.455437°
03/12/21 11:22 AM
Google

WATER TANKS

3.3 WATER ANALYSIS REPORT done by in environmental engineering lab of MIST

Parameter/ WHO permissible level	Observed Value		Methodology
	Sample 1 drinking water	Sample2 Bore well water	
colour	Colour less	Colour less	
pH/6.5-6.8	**5.8**	**6.2**	**pH meter**
Turbidity /5-10NTU	**3**	**12**	**Turnidity meter**
Conductance/0.4mS cm-1	**15.3**	**8.32**	**Conductivity meter**
Fe/0.30ppm	**0.2**	**0.32**	**spectroscopy**
Na/200ppm	**220**	**250**	**Flame photometer**
k/12 ppm	**11**	**15**	**Flame photmeter**
Mg/30 ppm	**45**	**82**	**Titrimeteric**
Ca/75 ppm	**70**	**87**	**Titrimeteric**
F-/1.5 ppm	**0.6**	**0.8**	**Titrimeteric**
Cl-/250 ppm	**8.9**	**21.61**	**Titrimeteric**
NO3-/ 50 ppm	**40**	**43**	**spectroscopy**
SO4/250 ppm	**250**	**285**	**Turbidity meter**

Sample 1:– Drinking Water

Sample 2:– Bore well water

3.3. RO Plant

- RO plant installed for ensuring safe drinking water for students and faculty
- The liquid waste generated by drinking water RO Plant is used for gardening

RO PLANT

3.4 Rain Water Harvesting Structure:

MIST takes the necessary measures to collect and reuses rain water. Surface runoff collected from the roads and open ground is allowed to flow through proper channels and then allowed to infiltrate into the ground to recharge ground water. Rain water is collected from the roofs of building through PVC pipes and then allowed to sell designed rain water structures. Rain water harvesting pits are properly designed and constructed to recharge the aquifers. Each recharge pit has size of 4ft X 4 ft X 6 ft and depth of each pit from the bottom consists of 1.5 ft gravel/pebbles, 1.5 ft coarse sand and 2 ft left for water collection.

RAIN WATER HARVESTING PIT

Chapter - 4

4 : WASTE MANAGEMENT

4.1. About Waste Audit

The purpose of the waste audit is to gain a detailed understanding of the types and weights of material being generated. The recommendations can be used to improve the economic and environmental performance of waste management efforts. For this audit, there is a need to discover the waste being generated and material are recyclables. Further the dispose mechanism adopted for both wet and dry waste has to be considered during audit. An effective waste reduction program must be based on current and accurate information on the quantity and composition of the waste stream. Therefore, there should be systematic procedure to review operations and subsequently, waste generation. Performing this exercise will define the composition of your discards by examining how materials enter and exit your facility.

All operations produce waste and there is nothing wrong by recognizing it. However today concern is over waste generation and increasing costs of collection and disposal are good reasons to find out how to reduce, increase recycling and try to cut costs. An audit alone will not reduce your waste. Rather, it is the starting point that will enable your work to make informed decisions on how to allocate resources for source reduction and recycling programs.

In long run this saves money, reduces waste and disposal costs and creates positive environment campus image. This also helps in devising the ways and methods of reducing wastes at the source.

Hazardous Waste – Institute adopts standard operating procedures for safe disposal of hazardous chemicals collected in the chemistry laboratory and other allied departments. The chemicals like acids utilized for experiments are very negligible hazardous chemicals.

4.2. Waste classification & Quantity

MIST has following solid waste management:

- Waste collection bins are placed in the classrooms, canteen and in the college hostels to collect the solid waste materials like cool drink cans/ bottles, paper etc
- Around 80 Kg/day organic waste is being generated from the canteen.
- Bio gas plant is installed near college canteen to utilize food waste generated.
- Waste Material from the construction of building, such as cement, brick pieces, gravel, sand etc are collected and reused for land filling and other small constructions in the college.
- College Management has banned the usage of plastic bottles in the campus.

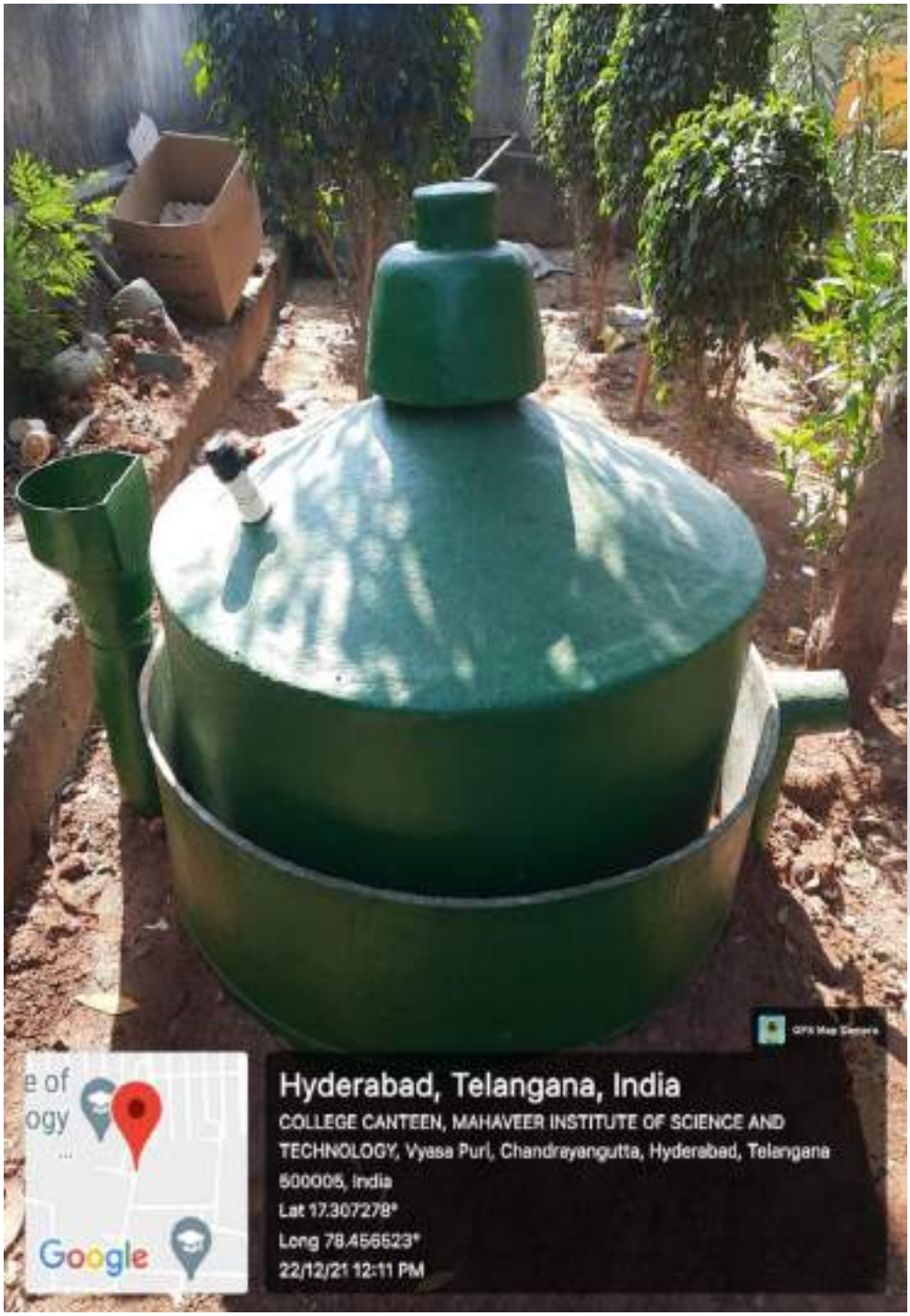
SNo	Source	Types of Waste	Quantity of waste produced per year
1	Canteen	Food	250 Kgs
		Plastic	600 Kg
2	Labs, Classrooms, administrative office	Books, papers	18 tons
3	Labs	E-Waste	30 Kgs
4	Construction Site	Construction Waste	1000 Kgs
5	Garden	Horticulture	80 Kgs
6	Garden & Campus	Rubbish	3650 Kgs
7	Washrooms	Sanitary	480 Kgs
8	Chemistry Labs	Chemical Waste	10 Kgs

Source	Type of waste	Description
Canteen	Food	Waste obtained as result of preparation, cooking and serving of food, waste produced due is fed into a bio gas plant is installed at college canteen for utilizing the food waste.
	Plastic	The plastic waste consists of used water bottles, broken chairs, milkshake tins etc. These are collected every day in the evening and are stored and sent to recycling unit with the support of Urban Rebox IT Pvt Ltd,an authorized agency of ITC
Labs, classrooms, administrative office	Books & Other papers	Books, newspapers, record etc are collected at the end of each semester and sent to recycling unit. Similarly the exam papers, sheets are collected and recycled every year.
Labs	E-Waste	Mainly consists of chips, electronic material etc. These materials are also sent to recycling unit with the support of Urban Rebox IT Pvt Ltd,an authorized agency of ITC.
Construction Site	Construction Waste	Consists of the waste produced during construction or repairs of the blocks. It consists of cement, card board, wood, iron material etc
Garden	Horticulture	Consists of twigs, dry leaves, flowers & fruits fallen from the plants etc
Garden & Campus	Rubbish	It includes two types of waste 1. Combustible (primarily organic), paper card boards, cartons, wood, leather, grass, leaves etc 2. Non-combustible (primarily inorganic)- metals, stones and grass etc
Washrooms	Sanitary	It consists of sanitary waste like pads,sanitary pad burners are installed for safe disposal.
Chemistry Labs	Chemical Waste	The chemical waste mainly consist of chemicals that are used in laboratory and the chemicals which are expired cannot be used further

4.3. Collection & Storage of waste

The Wet waste is being sent to compost unit and resulted manure is used for plants in the campus. And the dry waste is collected separately item wise and sent to recycling unit with the support of Urban Rebox IT private Ltd, agency of ITC. Initially they the stored at safe place within the campus and then collected by Urban Rebox IT private Ltd, agency of ITC monthly once depending on the quantity of the material. Twin bins are installed at required places and for wet waste two types of compost units are being maintained. The biogas plant has been installed near the canteen which generates the methane gas by using the wet waste generated by the canteen. The biogas can be utilized by the canteen for the purpose of cooking. The exhaust of the biogas plant can be used a manure for the plants.

COLLECTING DRY AND WET WASTE BINS



BIOGAS PLANT

4.4. E-Waste Management

- Computers and their parts, telephones, printers and other electronic devices become obsolete or do not function properly after some years are considered to be e- waste.
- Proper collection and disposal of e-waste is very important as they are mostly made of hazardous metals like lead, cadmium etc.
- All the E-Waste like key boards, mother boards, printers etc generated in the college premises is stored in a separate room.
- Institute has MoU with Urban Rebox IT private Ltd, agency of ITC., for the safe disposal of E-Waste.
- Urban Rebox IT private Ltd, agency of ITC collect the E-Waste periodically.
- The printer cartridges are refilled outside the college.

REBOX

MEMORANDUM OF UNDERSTANDING

This **Memorandum of Understanding** is made and executed on **2nd January 2021** at **Hyderabad**.

BY AND BETWEEN

Mahaveer Institute of Science & Technology, Vyasapuri, Bandlaguda, Keshavagiri (P.O), Hyderabad-500005, its administrators, assigns and successors represented by Dr. Shankar Ram, Principal, who is duly authorized to sign and execute the MoU.

Being the First Part

AND

Urban Rebox IT Private Ltd, an authorized agency of ITC having its principal office situated at No. # 11-3-362/3, Mohammadguda, Secunderabad, Hyderabad-500061 and Represented by Mr. D. Sai Krishna, Manager referred as **"Rebox"**

Being the Second Part

Whereas Mahaveer Institute of Science & Technology has agreed to collect and give away the dry recyclable waste including any kind of paper waste and old records generated in its college and form Swachh WOW Hyderabad Chapter.

1. **NOW THIS MOU WITNESSETH AS UNDER:**
   This is an agreement for a synergic alliance between Mahaveer Institute of Science & Technology, Vyasapuri, Bandlaguda, Keshavagiri (P.O), Hyderabad-500005 and Rebox for the social cause of recycling of Dry Waste and Environment Protection through recycling.

2. **Time period:** This MOU shall be for a period of one year commencing from the date of signing of this MOU.

3. **Roles and Responsibilities of Mahaveer Institute of Science & Technology:**

   1. To ensure source segregation of dry and wet waste at College premise through its Teaching staff, housekeeping staff and Students.
   2. Mahaveer Institute of Science & Technology will give away any kind of paper waste, dry recyclable waste and old records to Rebox at price agreed mutually. Rebox will pay Rs.9/kg for any kind of Paper waste and Old records/Dull white paper will pay Rs. 4/Kg. for metal scrap Rebox shall pay Rs. 10/Kg and for plastic waste Rebox will pay Rs. 4/Kg. For e-waste Rebox shall may as per annexure – 1.
   3. Mahaveer Institute of Science & Technology shall form Swachh WOW Hyderabad Chapter in the college with Student Volunteers and adopt nearby Schools or Colonies to promote Source Segregation through student volunteers.MARI shall provide participation certificates to the students.
   4. Mahaveer Institute of Science & Technology shall provide students for Internship in WOW Program.MARI shall provide internship certificate to the students.

URBAN REBOX IT PVT. LTD.
#11-3-362/3, MR Complex, Srinivas Nagar, Warasiguda
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

REBOX

4. Mahaveer Institute of Science &Technologyshall provide students for Internship in WOW Program.MARIshall provide internship certificate to the students.
5. Mahaveer Institute of Science &Technologyshall motivate students to bring dry recyclables like paper, plastic, metal etc. from their home and donate to WOW initiative.
6. Mahaveer Institute of Science &Technologywill put-up color-coded bins for waste segregation at different points in College premises.

4. Roles and Responsibilities of URBAN REBOX:

1. ITC-MARI will train the students and housekeeping staff on source segregation and through them inculcate the habit of source segregation among the other students.
2. Rebox will collect dry recyclable waste and old records from College and bring to the Dry Resource Collection Centre (DRCC) without any spillage.
3. Rebox will organize sorting of the dry waste into different categories, baling and appropriate disposal of dry waste.
4. Rebox shall coordinate with ITC and undertake necessary measures for dispatch of the sorted recyclables for recycling at its own cost.
5. Rebox will make payment to Mahaveer Institute of Science &Technologydirectly into their accounts for the dry recyclable waste collected against the accurate weighment and the type or category of the dry waste. The payment shall be made no later than 15 days from the date of purchase of dry waste from the waste collector. Franchisee on the request of Mahaveer Institute of Science &Technologymay give New Notebooks and Stationery against the value of dry recyclable waste lifted.

5. Performance of Obligations

1. The details laid out in this MOU, notwithstanding the essence and spirit of this MOU is an understanding between Mahaveer Institute of Science &Technologyand Rebox.

2. Any notice or other communication under or in connection with this agreement shall be in writing in the English language and shall be delivered personally or sent by way of e-mail to the party due to receive the notice or communication at its address set out in this contract or such other address as either party may specify by notice in writing to other.

ADDRESS FOR COMMUNICATION:
Following are the address to which all notices shall be sent

For URBAN REBOX:
Urban Rebox IT Pvt Ltd
H.No. #11-3-362/3,
Mohammadguda, Secunderabad,
Hyderabad - 500061
Phone No.9000479471
Email ID: urbanreboxit@gmail.com

For Mahaveer Institute of Science & Technology,
Vyasapuri, Bandlaguda, Keshavagiri (P.O),
Hyderabad-500005
Phone No: 9642705342
Email ID: Principal.mahaveer@gmail.com

URBAN REBOX IT PVT. LTD.
#11-3-362/3, MR Complex, Srinivas Nagar, Warasiguda
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

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6. Execution of this Agreement shall be deemed to be
   a) A confirmation by both the parties that no benefit, either in cash or kind has been provided by either party to the other party or to any officer or employee, or any relative/ associate of any officer or employee of either party or of any of their associate institutions/companies in order to enter into this Agreement, and
   b) An undertaking by both the parties not to provide any benefit, either in cash or kind to any officer/employee/relative/associate of any officer or employee of either party as reward or consideration either for entering into this MOU or other matter relating to this Agreement.

7. Other Terms

Force Majeure: Neither party shall be liable for damages for any delay or failure to perform its obligations here under, if such delay or failure is due to reasons beyond the control of the concerned party including without limitation, strikes, riots, wars, fires, epidemics, quarantine restrictions, unusually severe weather, earth quakes, explosions, acts of God or state or any public enemy or acts mandated by applicable laws, regulation or order, whether valid or invalid, of any Governmental body.

8. **Dispute Resolution**: It is understood by both the parties that this Agreement is for a social cause and not to make any profit out of the understanding. The Parties covenant that they will comply with all applicable laws and regulations in their conduct pursuant to this Agreement. Any dispute arising out of this Agreement shall be first attempted to settle amicably between the parties.

9. **Arbitration**
Any dispute which is not resolved amicably shall be finally settled by binding arbitration in respect to the matters concerning to the MOU with the Sole Arbitrator to be appointed by the mutual consent of both the parties. The Parties agree that the decision or award resulting from arbitration shall be final and binding upon the Parties.

Pending the submission of and/or decision on a dispute, the Parties shall continue to perform their respective obligations under this Agreement without prejudice to a final adjustment in accordance with such arbitration award.

10. **Governing and Jurisdiction**: This Agreement is subjected to the Jurisdiction of Courts at Hyderabad.
    - Both the parties shall agree that it will not make use of, disseminate, or in any way disclose any confidential information to any person, firm or business. Furthermore, the existence of any discussions, negotiations or agreements in progress between the parties shall not be released to any form of public media without written approval of both parties.

11. **Amendments**
This Agreement and the Schedules together constitute a complete and exclusive understanding of the terms of the Agreement between the Parties on the subject hereof

URBAN REBOX IT PVT. LTD.
#11-3-362/3, MR Complex, Srinivas Nagar, Warasiguda
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

REBOX

Annexure 1

Below are the items and rates listed

Sl.no	Description	Price (Rs/Piece)
1	**E-waste:**	
	CRT Monitors	60.00
	LCD/LED Monitors (working condition)	280.00
	LCD/LED Monitors (Non-working condition)	80.00
	CPU (working condition)	300.00
	CPU (non-working condition)	160.00
	Keyboard	10.00
	Mouse	1.00
	Dot Matrix Printer	70.00
	Laser Jet/ Desktop Printer	150.00
	Core/Dual core Laptop (non-working condition)	450.00
	i Processor Laptop (non-working condition)	600.00
	Core/Dual core Laptop (working condition)	1000.00
	i Processor Laptop (working condition)	1700.00
	UPS	80.00
	Cables (per KG)	15.00
	SMPS	15.00
	Head Phones	10.00

URBAN REBOX IT PVT. LTD. HYD

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Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM

REBOX

12. **NOTICE /Termination**
Any notice required to be given hereunder shall be given in writing at the address of each party set forth as below in this agreement or to such other address either party may substitute by written notice to the other. Either party may terminate this Agreement by giving 30 days written notice to the other party.

In witness whereof the parties hereto have signed this agreement on the day, month and year mentioned hereinbefore.

For Mahaveer Institute of Science & Technology

Dr. B. Nageswara Rao
Principal
Mahaveer Institute of Science & Technology

Vyasapuri, Bandlaguda, Keshavagiri (P O),
Hyderabad-500005

For URBAN REBOX

P Sai Krishna
Operations Manager

Witness

1.

2.

URBAN REBOX IT PVT. LTD.
#11-3-362/3, MR Complex, Srinivas Nagar, Warasiguda
Secunderabad, Telangana State - 500 061
GSTIN: 36AACCU3664R1ZM


ITC
Enduring Value
WOW
An ITC's Initiative
स्वच्छ भारत
MARI
Certificate of Appreciation
We take great pleasure in awarding certificate of appreciation to
MAHAVEER INSTITUTE OF SCIENCE AND TECHNOLOGY
for contributing 2690 kgs of paper waste to WOW-Wellbeing Out of Waste, A nation wide recycling initiative of ITC. Environmental savings by recycling of above contributed paper waste are
18830 gallons of water, 10760 kilowatts of energy, 6.15 cubic meters of landfill space and reduction of 6.19 mt of Co_2 During the year of 2021-22.
Let us make India Swachh and Green

NOISE LEVEL:

The college is very quiet and no noise pollution is seen. The maximum observed noise level is between 55-77dB in most of the places and times 80 to 85dB near some of machines in Lab. Noise levels are well within limits.

Note:

As per the Factories Act 1948 Permissible Exposures in cases of continuous Noise is 90bBA is to be perimitted.

SOLAR POWER:

A 100kWp Solar power plant is established to reduce dependency on Grid power which is predominantly fossil fuel based. Green Energy Percentage is about 50%.

College is already using a Solar powered UPS and Solar Street Lights.

Waste paper store room

E-waste store room

E-waste store room

E-WASTE CARRYING VECHICLE OF URBAN REBOX IT Pvt.Ltd

E-WASTE CARRYING VECHICLE OF URBAN REBOX IT Pvt.Ltd

Conclusion

- The overall environment of the college campus is being safe guarded with various activities. The utilization of the renewable resources is being done through Solar Power Plant and less energy consumption through LED Bulbs.
- Waste Management is also effectively managed through safe disposal systems of wet and dry waste. Especially recycling of e-waste, plastic waste and safe disposal of sanitary napkins etc. Apart from the implementation of the above, the college management has also been very keen on involving students continuously in creating awareness through several activities by NSS Club.
- College management is planning to install sewage treatment plant (STP) for treating waste water.
- College has MOU with Urban Rebox IT pvt Ltd,an authorized agency of ITC for recycling of e-waste, paper and plastic waste.
- Biogas plant is installed near college canteen to utilized food waste generated in college canteen.
- Sanitary pad burners are installed in ladies toilets for safe disposal of sanitary napkins.
- RO plant is installed for providing safe drinking water to students and faculty.

For Peepal Waste Managers

Partner

PRINCIPAL
MAHAVEER
INSTITUTE OF SCIENCE & TECHNOLOGY
Bandlaguda, Hyd-500 005

ISWA

Indian Biogas Association