

ENVIRONMENTAL AUDIT REPORT

Shikshan Prasarak Mandali's,
TILAK COLLEGE OF EDUCATION,
S. P. College Campus, Pune 411 030




Year: 2023-24


Prepared by:

ENGRESS SERVICES

Yashashree, 26, Nirmal Bag Society
Near Muktangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: engress123@gmail.com

Registration Certificates: UDYAM, MEDA, ASSOCHAM GEM-CP, ISO: 9001 & 14001:


भारत सरकार
Government of India
 सूक्ष्म, लघु एवं मध्यम उद्यम मंत्रालय
 Ministry of Micro, Small and Medium Enterprises


MSME
 MICRO, SMALL & MEDIUM ENTERPRISES

UDYAM REGISTRATION CERTIFICATE

UDYAM REGISTRATION NUMBER: UDYAM-MH-26-0135636

NAME OF ENTERPRISE: ENGRESS SERVICES

SNo.	Classification Year	Enterprise Type	Classification Date
1	2023-24	Micro	03/02/2024
2	2022-23	Micro	26/06/2022
3	2021-22	Micro	27/07/2021

TYPE OF ENTERPRISE: SERVICES

MAJOR ACTIVITY: SERVICES

SOCIAL CATEGORY OF ENTREPRENEUR: GENERAL

NAME OF UNIT(S):

S.No.	Name of Unit(s)
1	Engress Services

Flat/Door/Block No.	26	Name of Premises/ Building	Yashashree
Village/Town	Pune	Block	1
Road/Street/Lane	Lokmanya Nagar, Nirmal Baug Soc.	City	Pune
State	MAHARASHTRA	District	PUNE, Pin 411009
Mobile	8767447244	Email:	engress123@gmail.com

OFFICIAL ADDRESS OF ENTERPRISE

DATE OF INCORPORATION / REGISTRATION OF ENTERPRISE: 13/04/2021

DATE OF COMMENCEMENT OF PRODUCTION/BUSINESS: 13/04/2021

S.No.	NIC 2 Digit	NIC 4 Digit	NIC 5 Digit	Activity
1	70 - Activities of head offices; management consultancy activities	7020 - Management consultancy activities	70200 - Management consultancy activities	Services

NATIONAL INDUSTRY CLASSIFICATION CODE(S)

DATE OF UDYAM REGISTRATION: 27/07/2021



MAHARASHTRA ENERGY DEVELOPMENT AGENCY
Maharashtra Energy Development Agency
 (Government of Maharashtra Institution)
 Aundh Road, Opposite Spiccer College Road, Near Commissionerate of Animal Husbandary,
 Aundh, Pune, Maharashtra 411067
 Ph No: 020-35000450
 Email: ee@maharaja.com, Web: www.maharaja.com

ECN/2022-23/CR-43/1709 10th May, 2022

CERTIFICATE OF REGISTRATION FOR CLASS 'A'

We hereby certify that, the firm having following particulars is registered with MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA) under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

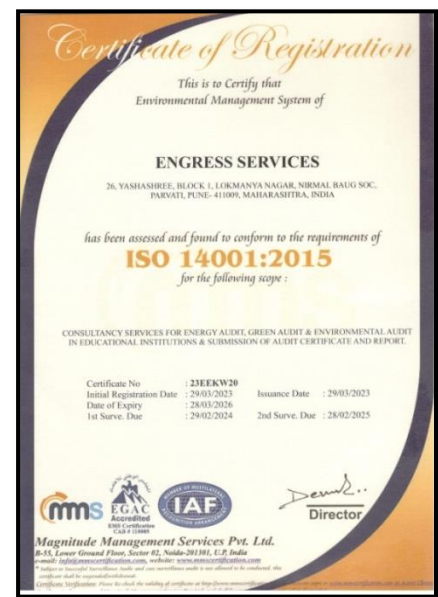
Name and Address of the firm : M/s Engress Services
Yashashree, 26, Nirmal Bag Society,
Near Mukhtangan English School,
Parvati, Pune - 411 009.

Registration Category : Empanelled Consultant for Energy Conservation Programme for Class 'A'

Registration Number : MEDA/ECN/2022-23/Class A/EA-32.

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit at any time without giving prior information to verify quarterly activities performed by the firm and canceling the registration, if the information is found incorrect.
- This empanelment is valid till 09th May, 2024 from the date of registration, to carry out energy audits under the Energy Conservation Programme
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.


 General Manager (EC)



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ACKNOWLEDGEMENT

We at Engress Services, Pune, express our sincere gratitude to the management of management of Shikshan Prasarak Mandali's Tilak College of Education, S. P. College Campus, Pune 411 030, for awarding us the assignment of Environmental Audit of their campus for the Academic Year: 2023-24.

We are thankful to all the Staff members for helping us during the field study.

EXECUTIVE SUMMARY

1. Shikshan Prasarak Mandal's Tilak College of Education, Pune consumes Energy in the form of **Electrical Energy**; used for various equipment.

2. Pollution due to College Activities:

- **Air pollution:** Mainly CO₂ on account of Electricity Consumption
- **Solid Waste:** Bio degradable Garden Waste, Paper & Plastic Waste
- **Liquid Waste:** Human liquid waste

3. Present Energy Consumption & CO₂ Emission:

No	Particulars	Value	Unit
1	Annual Energy Purchased	8703	kWh
2	Annual CO ₂ Emissions	8.09	MT

4. Usage of Renewable Energy & Reduction in CO₂ Emission:

- The College has installed Roof Top Solar PV Plant of Capacity **10 kWp**.
- The Energy generated by Solar PV Plant in 2023-24 is **12000 kWh**.
- Reduction in CO₂ Emissions in 2023-24 is **11.16 MT**

5. Indoor Air Quality Parameters:

No	Parameter/Value	AQI	PM-2.5	PM-10
1	Maximum	81	49	60
2	Minimum	75	46	54

6. Indoor Lux & Noise Level Parameters:

No	Parameter/Value	Lux Level	Noise Level, dB
1	Maximum	236	45.6
2	Minimum	215	43.9

7. Waste Management:

No	Head	Particulars
1	Solid Waste	Segregation of Waste at source
2	Liquid Waste	Installed Sewage Treatment Plant
3	E Waste	Disposed of by the Parent Society

8. Rain Water Management:

The Rain water falling on terrace is collected through Pipe and is used to increase the underground water table.

9. Environment Friendly Initiatives:

- Tree Plantation in the campus.
- Creation of awareness on Plastic Free Campus by Display of Posters

10. Assumptions:

1. **1 kWh** of Electrical Energy releases **0.93 Kg of CO₂** into atmosphere
2. Energy generated by Roof Top Solar PV Plant: **4 kWh/kWp per Day**
3. Annual Solar Energy generation Days: **300 Nos**

11. References:

- For CO₂ Emissions: www.ccd.gujarat.gov.in
- For Solar PV Energy generation: www.solarrooftop.gov.in
- For Various Indoor Air Parameters: www.ishrae.com
- For AQI & Water Quality Standards: www.cpcb.com

ABBREVIATIONS

kWh	:	kilo-Watt Hour
Qty	:	Quantity
MT	:	Metric Ton
CO ₂	:	Carbon Di Oxide
kWp	:	Kilo Watt Peak
AQI	:	Air Quality Index
PM2.5	:	Particulate Matter of Size 2.5 microns
PM 10	:	Particulate Matter of Size 10 microns
CPCB	:	Central Pollution Control Board
ISHARE	:	The Indian Society of Heating & Refrigerating & Air Conditioning Engineers

CHAPTER-I INTRODUCTION

1. Important Definitions:

1.1. Environment: Definition as per environment Protection Act: 1986

Environment includes water, air and land and the inter-relationship which exists among and between Water, Air, Land and Human beings, other living creatures, plants microorganism and property

1.2. Environmental Audit: Definition:

According to UNEP, 1990, "Environmental audit can be defined as a management tool comprising systematic, documented and periodic evaluation of how well environmental organization management and equipment are performing with an aim of helping to regularize the environment

1.2 Key Study Points:

No	Particulars
1	Study of Present Resource Consumption & CO ₂ Emission
2	Study of Usage of Renewable Energy
3	Study of Indoor Air Quality
4	Study of Indoor Lux & Noise Level
5	Study of Water Management
6	Study of Waste Management Practices
7	Study of Environment Friendly Practices

1.3 College Location Image:



College
Campus

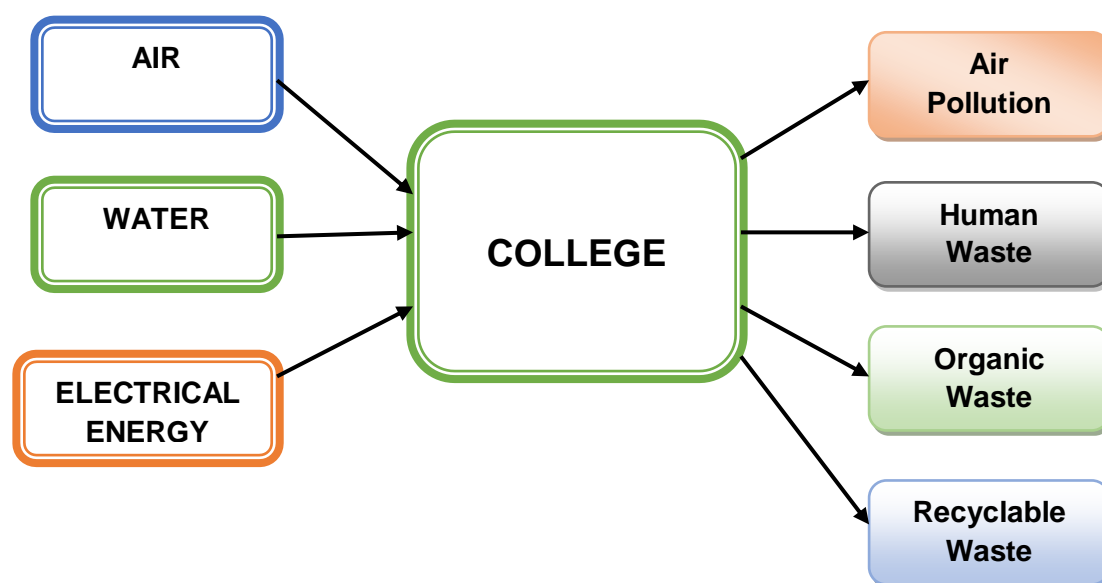
CHAPTER-II STUDY OF RESOURCE CONSUMPTION & CO₂ EMISSION

The College consumes following basic/derived Resources:

1. Air
2. Water
3. Electrical Energy

We try to draw a schematic diagram for the College System & Environment as under.

Chart No 1: Representation of Resource Requirement & Waste of a College:



Now we compute the Generation of CO₂ on account of consumption of Electrical Energy. The basis of Calculation for CO₂ emissions due to Electrical Energy is as under.

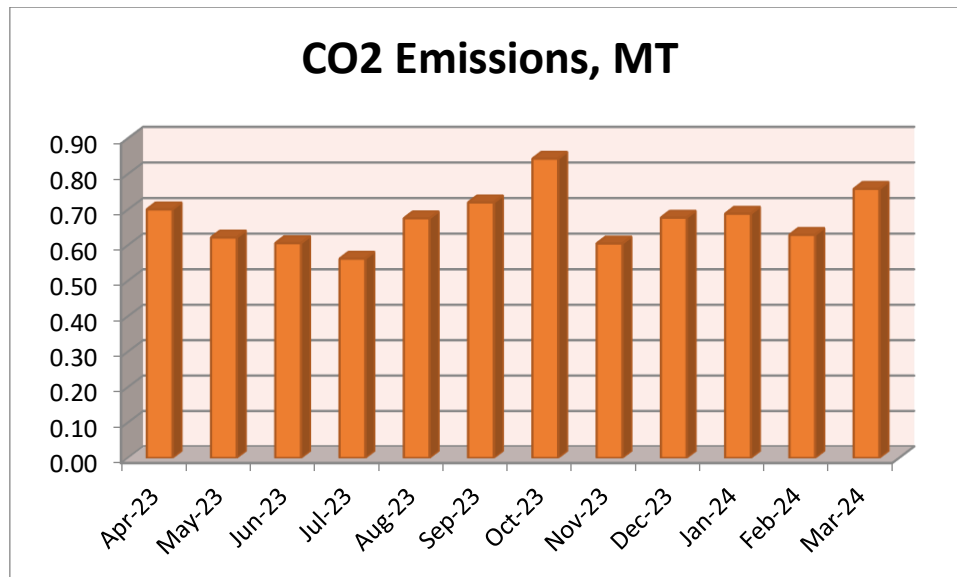
- **1 kWh** of Electrical Energy releases **0.93 Kg of CO₂** into atmosphere

Table No 1: Study of Purchase of Energy & CO₂ Emissions: 2023-24:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-23	754	0.70
2	May-23	669	0.62
3	Jun-23	652	0.61
4	Jul-23	605	0.56
5	Aug-23	727	0.68
6	Sep-23	775	0.72
7	Oct-23	907	0.84

8	Nov-23	651	0.61
9	Dec-23	729	0.68
10	Jan-24	741	0.69
11	Feb-24	677	0.63
12	Mar-24	816	0.76
13	Total	8703	8.09
14	Maximum	907	0.84
15	Minimum	605	0.56
16	Average	725.25	0.67

Chart No 2: Month wise CO₂ Emissions:



CHAPTER III

STUDY OF USAGE OF RENEWABLE ENERGY

The College has installed a Roof Top Solar PV Plant of capacity **10 kWp**.

In the following Table we present the Annual Reduction in CO₂ Emissions due to Solar PV Plant.

Table No 2: Computation of Annual Reduction in CO₂ Emissions:

No	Particulars	Value	Unit
1	Installed Roof Top Solar PV Plant Capacity	10	kWp
2	Average Daily Energy Generated	4	kWh/kWp
3	Annual Generation Days	300	Nos
4	Annual Solar Energy Generated	12000	kWh
5	1 kWh of Electrical Energy emits	0.93	Kg of CO ₂
6	Annual Reduction in CO ₂ Emissions = (4) * (5) /1000	11.16	MT

Photograph of Roof Top Solar PV Plant:



CHAPTER IV STUDY OF INDOOR AIR QUALITY

1. Air: The common name given to the atmospheric gases used in breathing and photosynthesis.

2. Air quality is a measure of the suitability of air for breathing by people, plants and animals.

3. Air Quality Index: Air Quality Index (AQI) is a number used by government agencies to measure the **Air Pollution** levels and communicate it to the population.

In this Chapter, we present three important Parameters: **AQI**- Air Quality Index, **PM-2.5**- Particulate Matter of Size 2.5 micron and **PM-10**- Particulate Matter of Size 10 micron

Table No 3: Indoor Air Quality Parameters:

No	Location	AQI	PM2.5	PM10
1	Principal Cabin	75	45	54
2	Admin Office	81	49	60
3	Class Room	80	46	57
4	Computer Lab	76	46	55
5	Library	79	48	56
	Maximum	81	49	60
	Minimum	75	46	54

Table No 4: Air Quality Index Values & Concentration of PM 2.5 & PM10: (By CPCB):

No	Category	AQI Value	Concentration Range, PM 2.5	Concentration Range, PM 10
1	Good	0 to 50	0 to 30	0 to 50
2	Satisfactory	51 to 100	31 to 60	51 to 100
3	Moderately Polluted	101 to 200	61 to 90	101 to 250
4	Poor	201 to 300	91 to 120	251 to 350
5	Very Poor	301 to 400	121 to 250	351 to 430
6	Severe	401 to 500	250 +	430 +

Conclusion:

From the above measured values, we conclude that the observed values of AQI, PM-2.5 & PM-10 are in the **Satisfactory Range**, as per the guidelines given by Central Pollution Control Board.

CHAPTER V STUDY OF INDOOR LUX & NOISE PARAMETERS

In this Chapter, we present the various Indoor Comfort Parameters measured during the Audit. The Parameters include: **Lux Level and Noise Level.**

Table No 5: Study of Indoor Comfort Condition Parameters:

No	Location	Lux Level, Lumen	Noise Level, dB
1	Principal Cabin	215	45.6
2	Admin Office	223	44.3
3	Class Room	236	45
4	Computer Lab	219	43.9
5	Library	226	44
	Maximum	236	45.6
	Minimum	215	43.9

Recommended Lux & Noise Level: As per BEE & ISHRAE Guidelines:

A) Noise Level Reference:		
No	Location	Noise Level Range, dB
1	Offices	45-50
2	Occupied Class Room	40-45
3	Libraries	35-40
B) Reference Lux Level, Lumens:		
1	For Class Rooms	200 Plus
2	For Reading Rooms	200 Plus

Conclusion:

From the above measured values, we conclude that:

- The Noise Level is within the prescribed Limit
- The Lux Level at various locations is Okay

CHAPTER VI STUDY OF RAIN WATER MANAGEMENT

The College has installed Rain Water Management Project; the Rain Water from the terrace is collected through Pipes and is used to increase the Underground Water Table.

Photograph of Rain Water Collecting Pipe Section:



**Rain Water
Collecting Pipe**

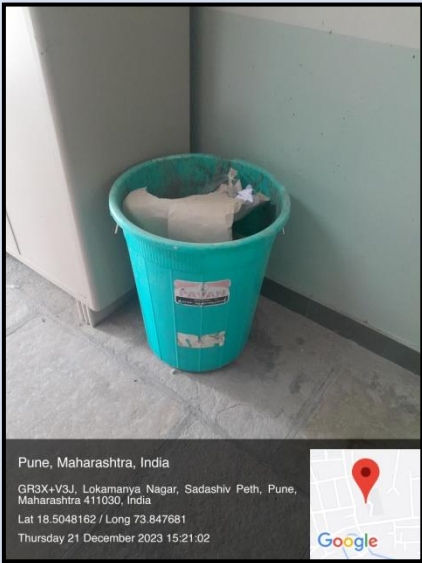

Pune, Maharashtra, India
Shop No 2, Govind smruti Apartment,1427 Sadashiv Peth, Khajina Chowk, near Sir Parashurambhau College, Lokamanya Nagar, Sadashiv Peth, Pune, Maharashtra 411030, India
Lat 18.5070661 / Long 73.8494414
Thursday 21 December 2023 16:16:07




CHAPTER-VII STUDY OF WASTE MANAGEMENT

In this Chapter, we present the Waste Management Practices, followed by the College.

Details of Waste Management Practices:




No	Head	Observation	Photograph
1	Solid Waste	Segregation of Waste at Source: Provision of Waste Collection Bins	<p>Photo of Waste Collection Bin:</p>  <p>Pune, Maharashtra, India GR3X+V3J, Lokamanya Nagar, Sadashiv Peth, Pune, Maharashtra 411030, India Lat 18.5048162 / Long 73.847681 Thursday 21 December 2023 15:21:02</p>
2	Organic Waste	Provision of Bio Composting Bed: For conversion into Bio Compost	<p>Photo of Bio Composting Bed:</p>  <p>225/1, Lokamanya Nagar, Sadashiv Peth, Pune, Maharashtra 411030, India Latitude 18.5056197° Longitude 73.847207° Local 05:03:29 PM Altitude 569 meters GMT 11:33:29 AM Thursday, 21.12.2023</p>

<p>3</p>	<p>E Waste</p>	<p>Provision of E Waste Collection Bin & disposal through Parent Society</p>	<p>Photograph of E Waste Collection Bin</p> 
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CHAPTER-VIII STUDY OF ENVIRONMENT FRIENDLY PRACTICES

In this Chapter, we present the Eco Friendly Practices, followed by the College.

Details of Eco Friendly Practices:

No	Head	Observation	Photograph
1	Tree Plantation	Tree Plantation in the Campus	<p>Internal Tree Plantation:</p>  <p>Pune, Maharashtra, India GR3X+V3J, Lokamanya Nagar, Sadashiv Peth, Pune, Maharashtra 411030, India Lat 18.5048246 / Long 73.8476461 Thursday 21 December 2023 15:21:22</p> 
2	Creation of Awareness among Stake Holders	Display of Poster on Plastic Free Campus	<p>Poster on Plastic Free Campus:</p>  <p>Pune, Maharashtra, India 16/6/12, Ramashram Society, Rukmini Sadan Society, Parugate, Sadashiv Peth, Pune, Maharashtra 411030, India Lat 18.508738 / Long 73.8479711 Thursday 21 December 2023 16:51:56</p> 