



### DVV Query

Criteria: 7	Institutional Values and Best Practices
Key Indicator: 7.1	<b>Institutional values and Social responsibility</b>
Metric No : 7.1.3	Quality audits on environment and energy regularly undertaken by the institution. The institutional environment and energy initiatives are confirmed through the following <ol style="list-style-type: none"> <li>1. Green audit / Environment audit</li> <li>2. Energy audit</li> <li>3. Clean and green campus initiatives</li> <li>4. Beyond the campus environmental promotion activities</li> </ol>

The institutional environment and energy initiatives are confirmed through the following Energy audit not provided, Hence input edited accordingly.

Kindly provide the following documents:

1. Policy document on environment and energy usage.
2. Energy Audit reports by involving the one external expert of the accredited Institution / Government / Govt. recognized organization.
3. Certificate from the auditing agency of Energy audit.

### DVV Clarifications Index

Sr. no.	Name of Particular DVV Query	Page no.	Document
1.	Policy document on environment and energy usage.	2-5	<a href="#">View Document</a>
2.	Energy Audit reports by involving the one external expert of the accredited Institution / Government / Govt. recognized organization.	6-39	<a href="#">View Document</a>
3.	Certificate of External Expert of the accredited Institution	40-41	<a href="#">View Document</a>
3.	Certificate from the auditing agency of Energy audit.	42	<a href="#">View Document</a>



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**DVV Query 1- Justification**

**Policy Document on Environment and Energy usage.**



Ref.

Date :

**Policy for**  
**Alternate Source of Energy, Energy Conservation and Environment friendly ecosystem**

**Purpose:** To build facilities for alternative energy sources in order to generate electricity and use energy more efficiently.

- Scope:**
- 1) Generation of electricity through solar panels
  - 2) Solar water heaters
  - 3) Use of LED Bulbs
  - 4) Sensor based solar powered street lights in campus
  - 5) Green Campus
  - 6) Water harvesting
  - 7) Waste Management
  - 8) Disabled Friendly environment



  
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Sant Dnyaneshwar Shikshan Sanstha's

**ANNA SAHEB DANGE COLLEGE OF B. PHARMACY, ASHTA**

(Approved by PCI, New Delhi, AICTE, New Delhi, DTE, Mumbai, Govt. of Maharashtra & Affiliated to Shivaji University, Kolhapur & MSBTE, Mumbai)



Ref.

Date :

**Objective:**

1. To determine which alternative energy sources the institute could employ.
2. To inform teachers, staff, and students about energy conservation at the institutes.
3. To inform teachers, staff, and students about the sustainability of the environment and the green movement.
4. To organize tree plantation program for sustaining the green environment.
5. To maintain ecofriendly environment by making restriction on use of non-degradable material.
6. To implement rain water harvesting techniques.
7. To make provision for degradable and non-degradable waste management.
8. To assist physically challenged people in making advantage of a disabled-friendly environment.



  
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Ref.

Date :

**Implementation:**

1. We have built sensor-based solar street lights, solar water heaters, and solar panels that are user-friendly to everyone.
2. We strongly advise everyone using a device to switch off lights, fans, and other electronic equipment while not in use.
3. All the classrooms, corridors and labs should be properly ventilated for optimum utilization of sunlight to reduce the consumption of electricity.
4. We use low power consumption electric devices such as LED bulb, LED tubes etc.
5. As part of the National Service Scheme, we arrange events such as tree planting and 'Swachhata Abhiyaan' every year.
6. We have prohibited the usage of plastic of any form on campus.
7. Every vehicle that often enters the campus should be under pollution control (PUC).
8. Every third Saturday of the month, on campus, we celebrate No Vehicle Day.
9. We firmly advocated for the usage of electric vehicles.
10. We have Memorandums of Understanding with many organizations in order to preserve an environmentally friendly atmosphere.
11. Degradable and non-degradable garbage is forwarded for recycling under the terms of the MoU's.



  
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Date :

12. We have made arrangement for rain water harvesting through open well recharge, ground water recharge etc.
13. We have built campus environments with ramps and lift for easy access to class room for physically challenged person.
14. Wheel-chair and handicapped washrooms are also available to maintain disabled-friendly environment.

All these implementation are made to maintain eco-friendly environment at the campus.

This policy is finalized in IQAC meeting.



*G. D. D.*  
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## DVV Query 2-Justification

**Energy Audit reports by involving the one external expert of the accredited Institution / Government / Govt. recognized organization.**

### II. Acknowledgement

Energy Audit Team of SITCOE expresses our sincere gratitude to management of Annasaheb Dange College of B Pharmacy, Ashta, for providing us an opportunity to conduct an Energy Audit of their organization located in Ashta Dist. SangliKolhapur 416301. We are grateful to **Hon. R. A. Kanai** Ex. Director, **Dr. M. G. Saralaya** Principal **Prof. S. S. Mohite** Head Civil Engineering Department and other officials for showing keen interest in the study and for the help and co-operation extended to SITCOE Energy Audit Team during study.

We do hope that you will find the recommendations given in this report useful in helping you save energy. While we have made every attempt to adhere to high quality standards, in both data collection and analysis, as well as in presentation through the report, we should welcome any suggestions from your side as to how we can improve further.

In case of any suggestions or queries:

**Sharad Institute of Technology COE, Yadrav**

Dr. Sanjay Khot (BEE Accredited Energy Auditor AEA-0312)

Email: [principal@sitcoe.org.in](mailto:principal@sitcoe.org.in)

Mobile- +91 7350542020

Yadrav (Ichalkaranji), Tal. Shirol,

Dist. Kolhapur -416121, Maharashtra.



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Annasaheb Dange College of B Pharmacy, Ashta

Energy Audit Report 2022-23

### III. Introduction

Project	Energy Audit
Client	Annasaheb Dange College of B Pharmacy, Ashta
Segment	Academic Building
Contact	<b>Dr. M. G. Saralaya</b> (Principal) <b>Prof. Santosh Mohite</b> (Head, Civil Engg. Department)
Site	Annasaheb Dange College of B Pharmacy, Ashta, Dist. Sangli 416301, Maharashtra, India
Consultant	<b>Dr. Sanjay Khot (AEA-0312)</b> BEE Accredited Energy Auditor
Involved from college	Mr. Prakash Shirrang Kamble Mr. Desai Dilip Kashinath Mr. Siddha Anandrao Babaso Mr. Waghmare Rushikesh Dashrath Mr. Patil Sujit Sanjay
Involved faculty	Dr. M. M. Khade Mr. U. S. Patil Mr. C. S. Patil
Duration	February 2023
Project scope	Conducting energy audit as per Bureau of Energy Efficiency (BEE) New Delhi to establish energy consumption in the buildings of academic campus and estimate scope for energy saving and also to recommend energy efficient appliances in place of energy intensive with payback calculation.
Report	This document gives recommendations, details of survey and the way forward.
Notes	The suggestions/ alternatives in the audit report are based on the inventory, name plate details and usage of equipment systems. It is recommended to obtain vendor quotations before implementation.



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#### IV. Executive Summary

##### ❖ Highlights

Description	Units	Values
Total annual savings	₹	769153
Total investments	₹	1248854
Payback period	Years	1.62
Annual electricity consumption	kVAh	181580
Annual electricity cost/annum	₹	2652393

##### ❖ Impact of Proposed Energy Conservation Measures

Description	Units	Values
Electricity Saving	kWh/annum	52538
	%	28.93
Estimated annual cost reduction	₹/annum	769153
Simple Payback period	Years	1.62
Reduction in CO <sub>2</sub> emissions	MT/year	43.48





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❖ **Summary of Energy Conservation Measures**

❖ **Table 01: Summary of Energy Conservation Measures**

Sr. No.	Energy Conservation Measures	Annual Saving		Investment	Simple payback period	Reduction in CO <sub>2</sub> emissions
		kWh	₹	₹	Years	MT/Year
1	Replace conventional ceiling fan with energy efficient fan (352 Nos.)	31123	455643.65	1005180	2.21	25.52
2	Replace conventional tube with energy efficient tube (39 Nos.)	403	5902.85	5906.25	1.00	0.73
3	Replacement of old pump with energy efficient pump	21011	307607	237768	0.77	17.23
<b>Total</b>		<b>52538</b>	<b>769153</b>	<b>1248854</b>	<b>1.62</b>	<b>43.48</b>

**Table 02: Recommendation for nearly zero energy building**

Name of Building	Annual Electricity Consumption kWh	Daily Electricity Consumption kWh	Unit Charge	Solar PV System Required-kW <sub>p</sub>	Annual Electricity Generated by Solar kWh	Monetary Saving □	Investment @60000/kw <sub>p</sub>	Simple Payback
Pharmacy College	181580	497.48	14.64	166	161850	2369484.00	9960000	4.20



## 1. Energy and Utility System Description

Annasaheb Dange College of B Pharmacy, Ashta, Dist. – Sangli

Major utilities in the campus are

1. General
2. Electrical

### 1.1 Brief Description of each Facility

This study is being done under the indicative scope of work for conduct of Energy Audit specified by MEDA (Maharashtra Energy Development Agency) & BEE (Bureau of Energy Efficiency). This study is mainly carried out to identify saving areas in Annasaheb Dange College of B Pharmacy, Ashta with short term, medium term & long term investments, yielding significant savings. The study can be mainly divided into following groups.

#### 2.1.1 General

Energy Audit focuses on study of correlation of electricity consumption on production. Opportunities for load factor improvement, power factor improvements, etc.

#### b. Electrical

It includes motor load study of 1 HP & above by measuring input parameters (Voltage, Current, P.F., & kW), performance analysis of water pumps having capacities above 1 HP, performance analysis and identification of energy efficiency opportunities in motors, pumps, air compressors, lighting, etc.

### 1.2 Instrument Used

Following instruments are used for the study:

- a. Three phase power analyzer
- b. Lux Meter
- c. Measuring tape
- d. Anemometer
- e. Thermal imager

The site study was carried out from 15/02/2023 to 16/02/2023.

### 1.3 Energy Audit Team

- Dr. Sanjay A. Khot  
Dr. M. M. Khade  
Mr. U. S. Patil  
Mr. C. S. Patil



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## 2. Description and Energy Consumption

### 2.1 About Annasaheb Dange College of B Pharmacy, Ashta

The Annasaheb Dange College of Pharmacy is one of the foremost technical Institute in Western Maharashtra, distinguished by its commitment to improving the human condition through advanced science and technology. Established in 2016 the college is affiliated to Shivaji University, Maharashtra and approved by AICTE, New Delhi, DTE, Mumbai, Govt. of Maharashtra and PCI, New Delhi.

ADCP's campus occupies 33 acres in the heart of the city of Ashta, Sangli, where 500 undergraduate and 250 Diploma students receive a focused, industry-based education of Pharmacy.

ADCP offers a culture of academic excellence and opportunity, made all the richer by our diverse community of scholar-citizens and vibrant student life program.

### 2.2 Annual Energy Consumption

#### 2.2.1 Electricity

Annasaheb Dange College of B Pharmacy, Ashta is receiving electricity from MSEDCL. A part of the plant electricity is met by open access. Contract demand with MSEDCL is 200 kVA with a minimum billing demand 60% of contract demand during preceding 11 months.

#### 2.2.2 Marginal Energy Cost

Marginal cost of electricity is calculated based on the energy cost of electricity from EB and DG. This marginal cost is considered for the cost benefit analysis of energy conservation measures.

**Table 03: Marginal Energy Cost**

Description	Unit	Marginal Cost
Average monthly EB energy consumption	kVAh	60527
Average monthly DG energy consumption	kVAh	2546
Diesel cost	₹/L	93
Average basic cost of energy from EB	₹/ kVAh	9.21
% of Electricity from EB	%	96.37
% of Electricity generated with DG	%	4.21
DG energy generation cost	₹/ kVAh	12.56
Marginal cost of electricity	₹/ kVAh	14.70



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### 3. Energy Scenario

#### 3.1 Electrical Systems

##### 3.1.1 Electrical bill analysis

Annasaheb Dange College of B Pharmacy, Ashta is getting electricity supply from Maharashtra State Electricity Distribution Co. Ltd. Major portion of the energy consumption is used for academics and hostel.

The observations made during the study are given in the following sections.

#### The Tariff Structure at the plant

Tariff structure of the facility is given below

- Tariff Code = 146 HT-VIII B
- Supply voltage = 11 kV
- Contracted demand = 200 kVA
- Minimum billing demand = 120 kVA
- Demand charges = ₹ 432 per kVA
- TOD = Opted
- Unit charge = 9.21/kVAh

#### 1. Billing Demand

The billing demand during unrestricted period shall be minimum billing demand 65% contract demand or 75% highest billing demand during preceding 11 months, whichever is higher.

#### 2. Power factor (PF)

It shall be the responsibility of the HT Consumer to determine the capacity of PF correction apparatus and maintain an average PF of not less than 0.90.

#### 3. Time of Day Tariff

As per Maharashtra State Electricity Distribution Company Limited, HT consumers have an option to take Time of Day (TOD) tariff instead of the normal tariff. Under TOD tariff electricity consumption and maximum demand in respect of HT consumers for different periods of the day i.e. normal period, peak load period and off-peak load period could be recorded by installing TOD meter. The maximum demand and consumption recorded in different periods could be billed on the following rates of the tariff applicable.





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**Table 04: Time of Day Tariff (TOD)**

S. No	Description	Energy Charge (₹/kVAh)
<b>1</b>	<b>Energy Charges</b>	
(i)	00.00 Hrs.-06.00 Hrs. & 22:00 Hrs-06:00 Hrs.	-1.50
(ii)	06:00 Hrs-09:00 Hrs. & 12:00 Hrs-18:00 Hrs.	0.00
(iii)	09:00 Hrs-12:00 Hrs.	0.80
(iv)	18:00 Hrs-22:00 Hrs.	1.10
<b>2</b>	<b>Demand Charges</b>	Normal rate of Demand Charges

The analysis of plant electricity consumption from EB and Open Access is given below. For the electricity consumption analysis, electricity bill for the last fourteen months (Feb-22 to Jan-23) is considered.



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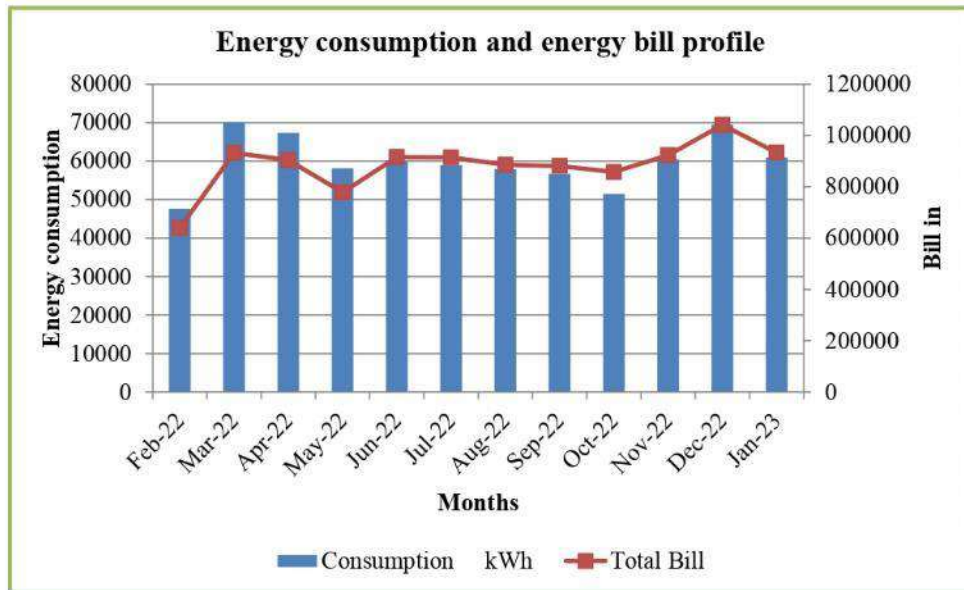
Table 05: Electrical Bill Analysis

Month	Contract Demand KVA	Billed Demand KVA	Maximum Demand KVA	Power Factor	Ideal PF	Consumption kWh	Consumption KVAh	Demand Charges	Wheeling Charge	Energy charges	TOD tariff EC	FAC	Electricity Duty	Tax on Sale	Incremental consumption on Rebate	Charges for Excess demand	Total Bill
Jan-23	200	172	141	0.990	1	60978	61594	78088	33876.70	551882.24	-7455.50	107789.50	160478.00	11610.21	-2877.75	0.00	933391.40
Dec-22	200	174	174	0.993	1	69525	70015	78996	38508.25	627334.40	-9842.90	122526.25	180079.62	13237.56	-9324.75	0.00	1041514.43
Nov-22	200	172	163	0.993	1	60489	60915	78088	33503.25	545798.40	-8284.30	106601.25	158698.39	11517.11	-2499.75	0.00	923422.35
Oct-22	200	229	229	0.991	1	51505	51973	103966	28585.15	465678.08	-8055.40	90952.75	147183.87	9806.55	0.00	19749.00	857866.00
Sep-22	200	182	182	0.991	1	56737	57195	82628	31457.25	512467.20	-6971.50	100091.25	151131.16	10802.72	0.00	0.00	881606.08
Aug-22	200	171	171	0.992	1	57964	58159	77634	31987.45	521104.64	-9196.70	101778.25	151894.60	10984.94	-389.25	0.00	885797.93
Jul-22	200	187	187	0.991	1	58945	59480	84898	32714.00	532940.80	-7002.00	104090.00	157004.57	11223.13	-1336.50	0.00	914532.00
Jun-22	200	162	162	0.990	1	60035	60641	73548	33352.55	543343.36	-6990.50	106121.75	157368.78	11450.66	-2163.75	0.00	916010.85
May-22	200	159	159	0.986	1	58187	59013	72186	32457.15	528756.48	-10263.70	11802.60	133337.09	11078.80	-766.50	0.00	778587.92
Apr-22	200	198	198	0.987	1	67400	68288	89892	37558.40	611860.48	-9790.90	13657.60	156067.29	12832.96	-7767.00	0.00	904310.83
Mar-22	200	164	164	0.991	1	70152	70789	70848	39641.84	651966.69	-8618.60	14157.80	161279.10	13356.94	-9818.25	0.00	932813.52
Feb-22	200	128	127	0.987	1	47630	48257	55296	27023.92	444446.97	-5569.40	0.00	109451.47	9068.75	0.00	0.00	639717.71
Min	200	128	127	0.986	1	47630	48257	55296	27023.92	444446.97	-10263.7	0	109451.47	9068.75	-9818.25	0	639717.71
Max	200	229	229	0.993	1	70152	70789	103966	39641.84	651966.69	-5569.4	122526.25	180079.62	13356.94	0	19749	1041514.43
Average	200	175	171	0.990	1	59962	60527	78839	33389	544798	-8170	73297	151998	11413	-3079	1646	884131
Total						719547	726319	946068	400665.91	6537579.74	-98041.4	879569	1823973.94	136950.33	-36943.5	19749	10609571.02



**Observation:**

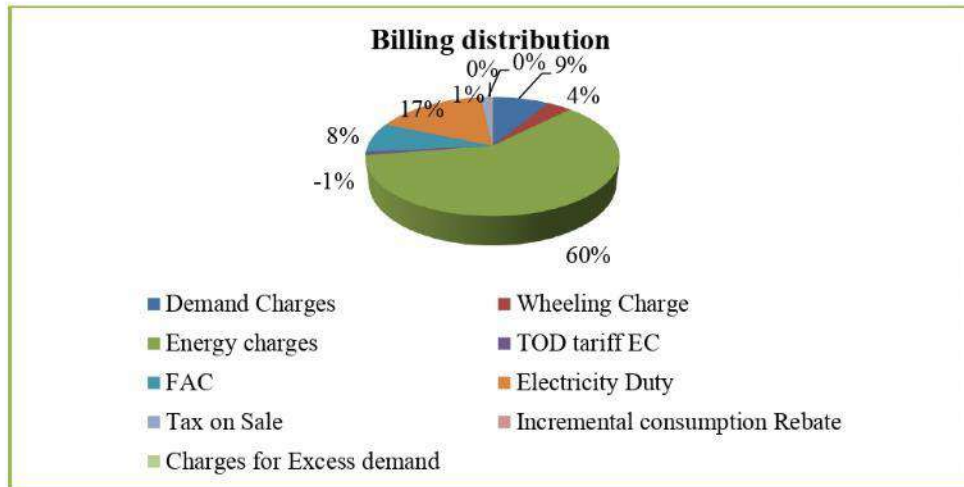
- Maximum consumption 70789 kVAh in month of March and minimum 48257 kVAh in month of February.
- The average energy consumption is 60257 kVAh..



**Figure 01: Consumption and Electricity bill profile**

**Observation:**

- Energy consumption varies from 47630 to 70152 kVAh from February 2022 to January 2023.
- The bill as per MERC for last twelve months is ₹ 10609571.

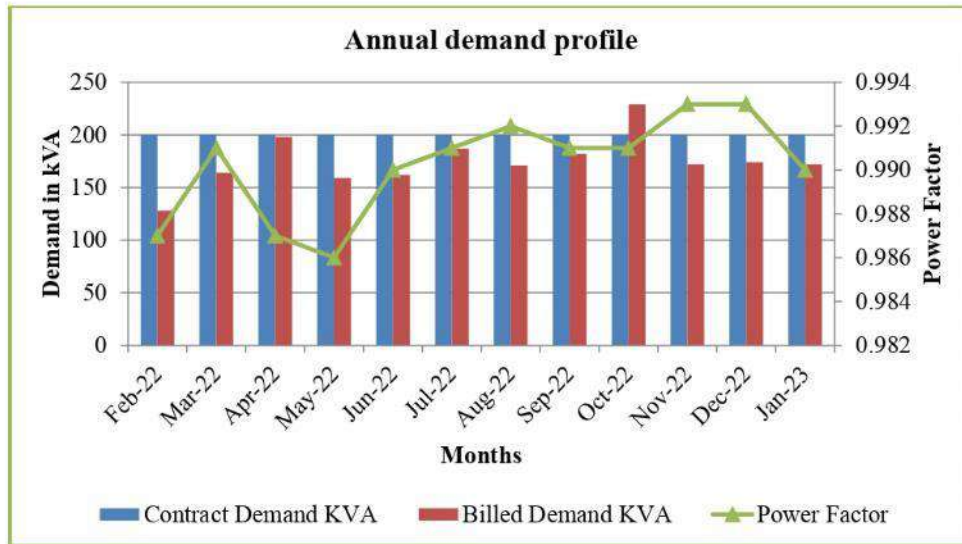


**Figure 02: Billing Distribution**

**Observations**

- ❖ Energy charges are 60 % of total bill.
- ❖ Demand charges are 9 % of total bill.





**Figure 03: Contract Demand, Recorded Demand and PF Profile**

**Observation:**

- The contract demand is 200 kVA and the minimum billing demand 60% contract demand or highest billing demand during preceding 11 months whichever is higher.
- Max demand recorded for is 229 kVA.
- The average demand recorded for twelve months; from February 2022 to January 2023 is 175 kVA.
- The lowest recorded demand in the month of February 2022 is 128 kVA & highest was 229 kVA in month of October 2022.
- The average energy consumption is 60527 kVAh.

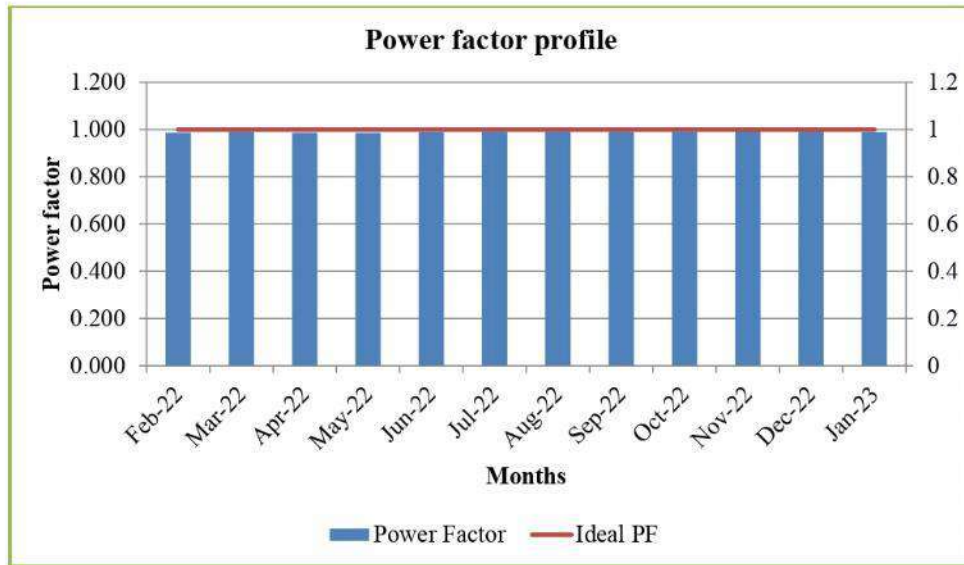


Figure 04: Power Factor Profile

**Observation:**

- Average power factor was 0.990
- The power factor is maintained.

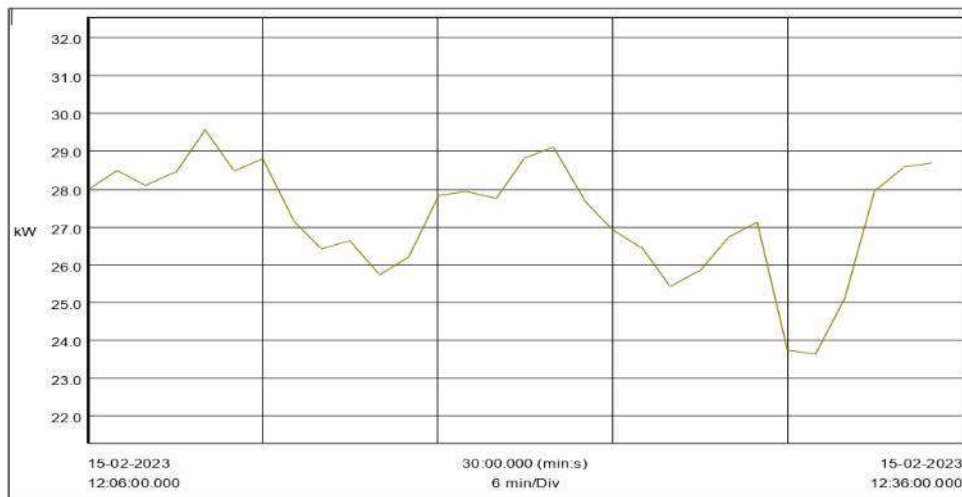


Figure 05: Power Profile of main supply with solar



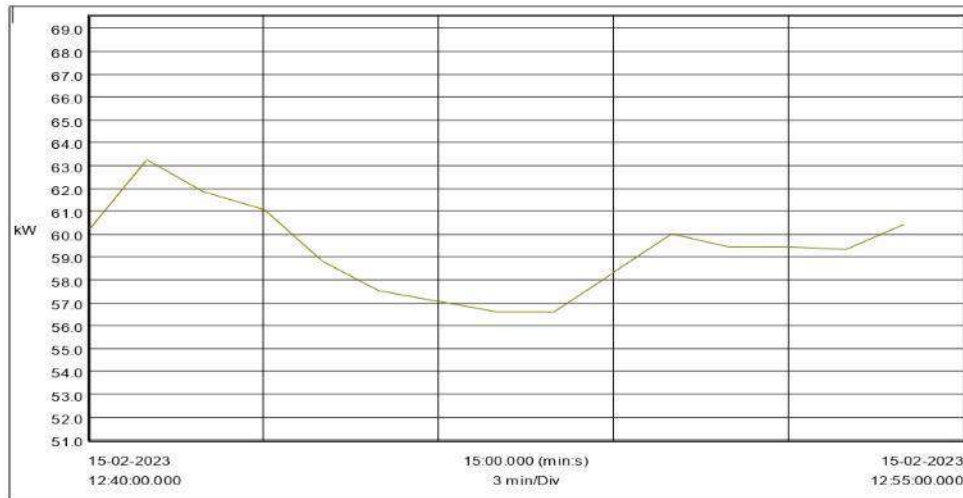
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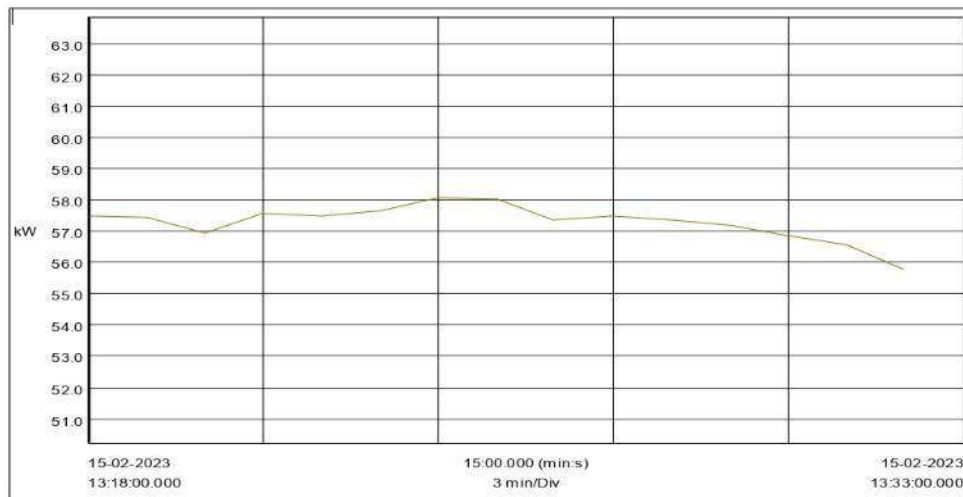


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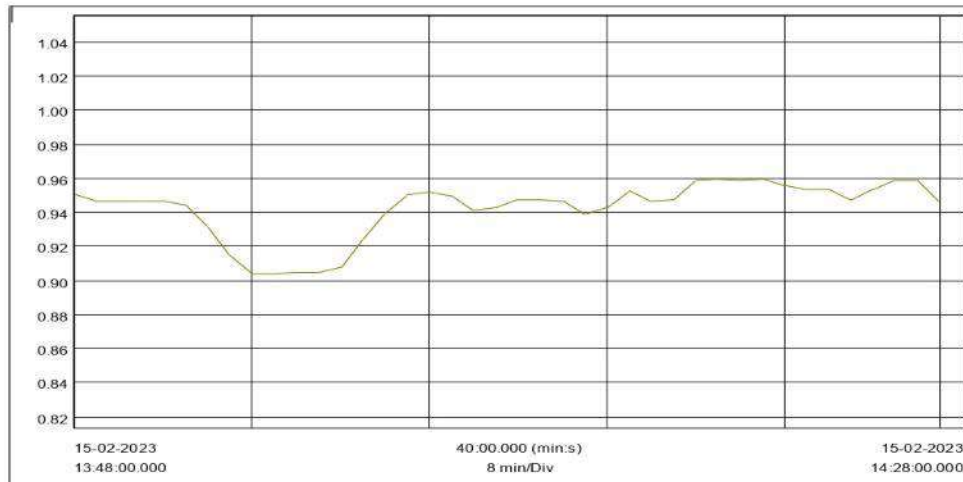
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**Figure 06: Power Profile of main supply without solar**



**Figure 07: Power Profile of main supply with solar**



**Figure 08: Power Profile of main supply of pharmacy building**

### 3.1.2 Diesel Generator

In JNV there are 3 DG sets. Following table shows the details of DG set.

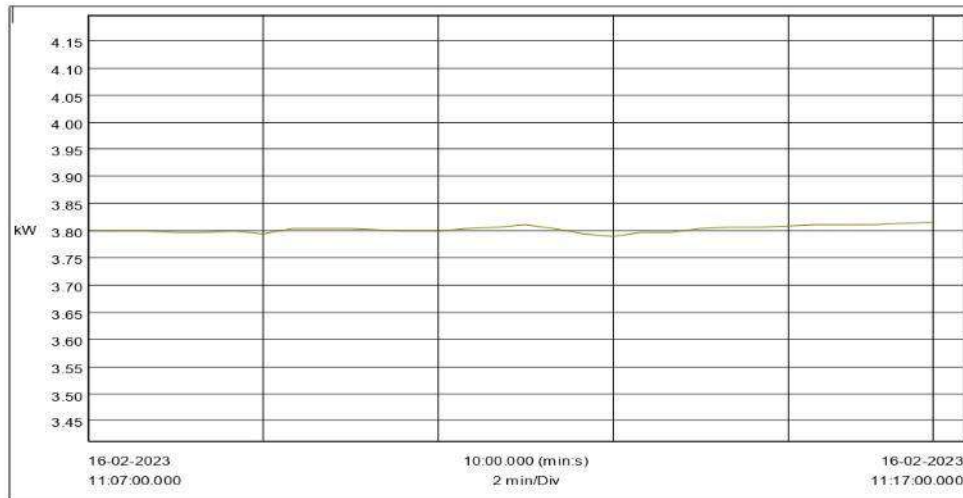
**Table 06: DG sets details**

Sr. No.	Name of DG set	Capacity in kVA	Usage (Lit)/week
1	02	125	272
2	01	63	24
3	01	40	48
<b>Total</b>	<b>04</b>	<b>228</b>	<b>344</b>

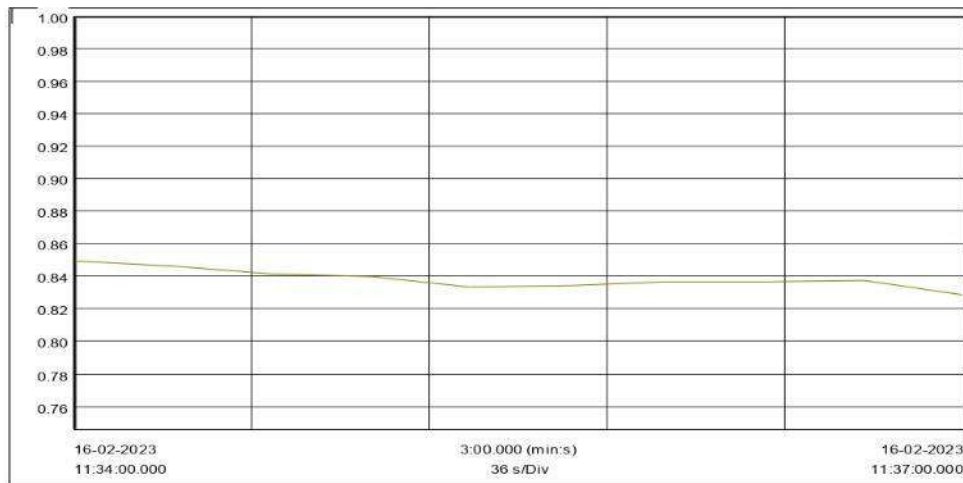
### 3.2 Water Pump

The performance analysis of the pumps used for water required for the institute is done based on the present operating parameters like water flow, head and power. Pumps of different capacities are installed based on the water flow requirement at different sections of the plant. The water supply of the institute is met by river and bore well. There are number of pumps are running mainly in the institute campus.

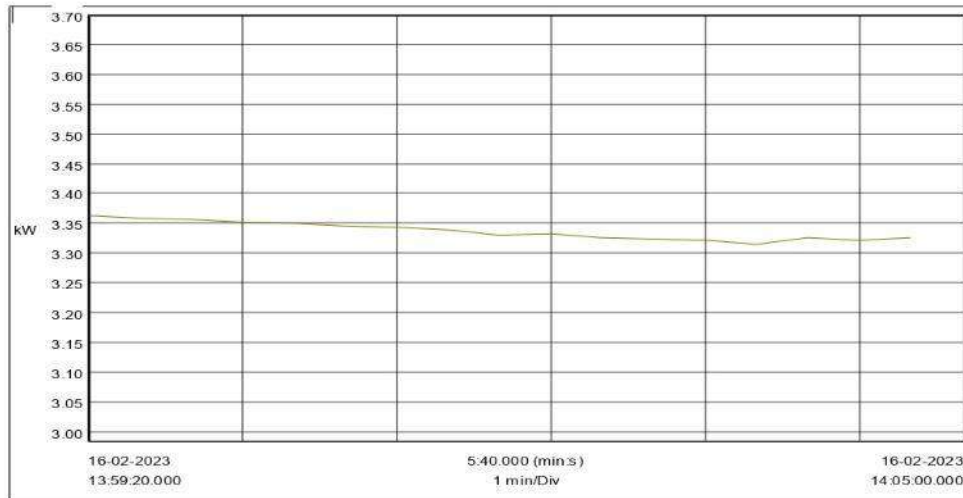




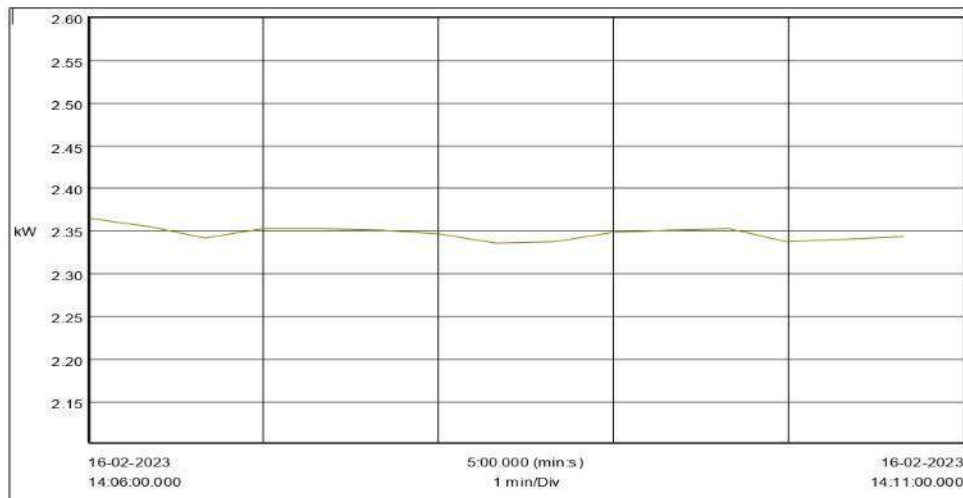
**Figure 09: Power Profile of submersible Pump for new ladies hostel**



**Figure 10: Power Profile submersible Pump for Old ladies hostel**



**Figure 11: Power Profile of submersible pump for sump tank**



**Figure 12: Power Profile of submersible pump of RO plant**



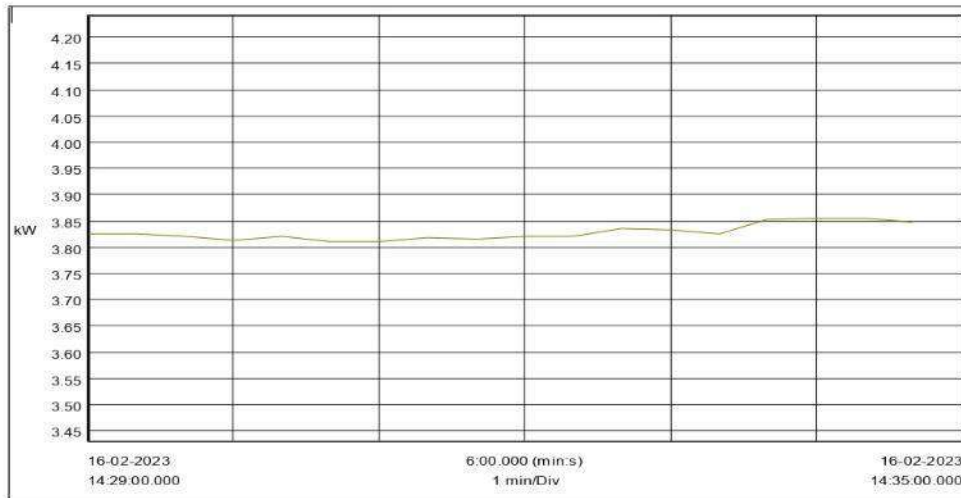
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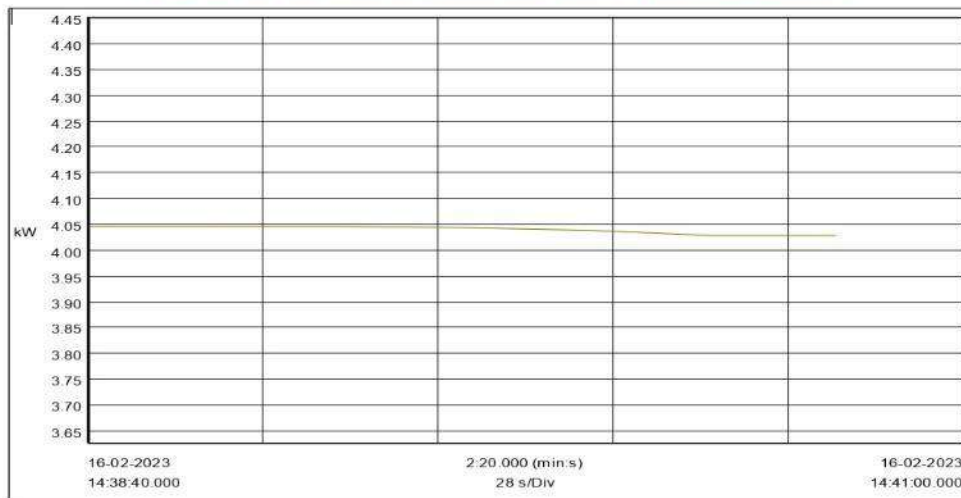


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**Figure 13: Power Profile of submersible pump of pharmacy building**



**Figure 14: Power Profile of submersible pump of Guest house**



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The Performance Analysis of the Pumps is given below.

**Table 07: Water Pump Performance Analysis**

Description	Units	Pump for New ladies hostel	Old Ladies hostel	Pump for sump	RO plant	Pump for sump	Pharmacy building	Guest house
<b>Design parameter</b>								
Rated output	HP	5	3	3	2	5	5	5
	kW	3.73	2.24	2.24	1.49	3.73	3.73	3.73
Method of starting		DOL	DOL	DOL	DOL	DOL	DOL	DOL
Motor Efficiency	%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%	91.20%
<b>Measured parameter</b>								
Voltage V1	Volts	394.4	367.8	393.4	390.9	384.6	387.6	392.9
Voltage V2	Volts	397.1	370.4	396	393.5	386.9	390	395.7
Voltage V3	Volts	396.8	396.3	396.5	394.4	388	390.9	394.6
Average Voltage	Volts	396.10	378.17	395.30	392.93	386.50	389.50	394.40
Voltage Unbalance	%	0.3%	4.8%	0.3%	0.4%	0.4%	0.4%	0.3%
Current A1	Amps	6.81	6.86	6.76	5.47	9.95	7.2	7.06
Current A2	Amps	6.99	7.02	6.76	5.57	10.09	7.19	7.2
Current A3	Amps	7.15	6.89	6.42	5.24	9.41	6.89	6.49
Average Current	Amps	6.98	6.92	6.65	5.43	9.82	7.09	6.92
Power Factor	-	0.797	0.839	0.732	0.635	0.879	0.799	0.853
Power	kW	3.804	3.814	3.338	2.349	5.788	3.83	4.041
Loading	%	93%	155%	136%	144%	142%	94%	99%

**Observations:**

- The pumps which are used are more than 5 years old.
- The motor input power is varying from 2.349 kW to 4.041 kW.
- Maximum efficiency of pump is usually near 75% of rated load.

The replacement options for the pumps with poor operating performance is given in the ECM section of the report.



### 3.3 Air Conditioning

Split AC are used for smart class room, computer lab & principal cabin. The list of AC is as follows.

**Table 08: AC Details with Location**

Sr. No.	Name	AC 1.5 ton	AC 2 ton	AC 20 Ton
1	Principal cabin (Blue Star)	01		
2	Board room (Blue star)	02		
3	Guest House (Blue Star) Inverter AC		03	
4	Guest House (Blue Star) central AC			01
<b>Total</b>		<b>03</b>	<b>03</b>	<b>01</b>

#### Observation:

- All AC are three star labelled.
- Guest house AC are inverter type.





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**3.4 Lighting System**

Lighting is provided in commercial buildings, indoor and outdoor for providing comfortable working environment. The primary objective is to provide the required lighting effect for the lowest installed load i.e. highest lighting at lowest power consumption. There are number of buildings in Campus. The details of inventories are shown in the table.

**Table 09: Building Inventory**

Name of Department	LED Panel (36W)	Spot Light (12W)	Hymus Tube Light (72W)	LED Tube (10 W)	LED Tube (20 W)	Tube (28 W)	Tube (40 W)	Fan	Wall fan	Exhaust Fan	LED Bulb Fitting (36 W)	LED bulb (5W)	LED bulb (9W)	LED bulb (10W)	LED bulb (12W)	LED bulb (15W)	LED bulb (18W)	Pedestal Fan	Projector	Computer	Refrigerator	Stability Chamber	UPS	Laptop	Ceiling light (15W)	Cooler	Printer	Xerox Machine	Scanner	AC	Freezer	Oven	Griller	Fryer	Mixer	Sound System (250W)	LED Screen	Incandescent Bulb					
Pharmacology Lab UG 46				12				7													1																						
Preparation room 1								1																																			
HoD Cabin				1				1																1																			
Staff Room				6				3																8																			
Ladies Toilet				2																						1																	
Gents Toilet				3																																							
Pantry				1																																							
HoD Cabin UG54				1				1												1																							
Preparation room 2 UG53								1																																			
APHE Lab UG55				13				7																																			
Computer cum Language lab UG31				12				8												20			1																				
Ladies Toilet				2																						1																	
Gents Toilet				3																																							



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Name of Department	LED Panel (36W)	Spot Light (12W)	Hymus Tube Light (72W)	LED Tube (10 W)	LED Tube (20 W)	Tube (28 W)	Tube (40 W)	Fan	Wall fan	Exhaust Fan	LED Bulb Fitting (36 W)	LED bulb (5W)	LED bulb (9W)	LED bulb (10W)	LED bulb (12W)	LED bulb (15W)	LED bulb (18W)	Pedestal Fan	Projector	Computer	Refrigerator	Stability Chamber	UPS	Laptop	Ceiling light (15W)	Cooler	Printer	Xerox Machine	Scanner	AC	Freezer	Oven	Griller	Fryer	Mixer	Sound System (250W)	LED Screen	Incandescent Bulb		
Handicapped Toilet				1																																				
boy's common room				12			8																																	
Pharceutical lab LG27				12			7																																	
Aseptic room LG26				1																																				
Preparation room				2			1																																	
Pharmaceutical Bio T LG25				12			6														1	1																		
C R LG24				12			8												1																					
Ladies Toilet				2																					1															
Gents Toilet				3																																				
Handicapped Toilet				1																																				
Girls common room				9			6																																	
Cafeteria LG18				10			17																							1	1	1	1	1						
Central store LG30				8			1																																	
Sports room				1																																				
First Aid room				1			1																																	
Pharmacy Practice room				4			4																																	
Preparation room				2			2																																	
Ladies Toilet				1																					1															
Gents Toilet				1																																				
Handicapped Toilet				1																																				



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Name of Department	LED Panel (36W)	Spot Light (12W)	Hymus Tube Light (72W)	LED Tube (10 W)	LED Tube (20 W)	Tube (28 W)	Tube (40 W)	Fan	Wall fan	Exhaust Fan	LED Bulb Fitting (36 W)	LED bulb (5W)	LED bulb (9W)	LED bulb (10W)	LED bulb (12W)	LED bulb (15W)	LED bulb (18W)	Pedestal Fan	Projector	Computer	Refrigerator	Stability Chamber	UPS	Laptop	Ceiling light (15W)	Cooler	Printer	Xerox Machine	Scanner	AC	Freezer	Oven	Griller	Fryer	Mixer	Sound System (250W)	LED Screen	Incandescent Bulb					
C R 12				8				7																																			
Seminar Hall								21			24																																
C R 17				8				6																																			
Ladies Toilet 19				1																						1																	
Gents Toilet 18				1																																							
Handicapped Toilet 20				1																																							
Corridor																									60	1																	
C R 21				8				7											1																								
HAP lab 22				8				4																																			
HoD cabin				1				1												2				1			1																
Preparation room				2				1																																			
Pharmacognocy lab 24				8				4		1																																	
Tutorial room				4				2																																			
Library								25												5						103		1															
Tutorial room (terrace )				6				3																																			
Tutorial room SF01				6																																							
<b>Administrative wing</b>																																											
Entrance																										43																	
Placement Office				8				2													1																						
Exam control room UG2				8				2													1								2														
Principal Cabin																		1		2						16		1															

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Name of Department	LED Panel (36W)	Spot Light (12W)	Hymus Tube Light (72W)	LED Tube (10 W)	LED Tube (20 W)	Tube (28 W)	Tube (40 W)	Fan	Wall fan	Exhaust Fan	LED Bulb Fitting (36 W)	LED bulb (5W)	LED bulb (9W)	LED bulb (10W)	LED bulb (12W)	LED bulb (15W)	LED bulb (18W)	Pedestal Fan	Projector	Computer	Refrigerator	Stability Chamber	UPS	Laptop	Ceiling light (15W)	Cooler	Printer	Xerox Machine	Scanner	AC	Freezer	Oven	Griller	Fryer	Mixer	Sound System (250W)	LED Screen	Incandescent Bulb				
Vice-Principal cabin				4				9										1	8						16		6	1	1													
Board Room																			1						16				2													
Wash room				1																							1															
Chemistry Lab 2					12			7		2																					1	2										
Dept. Office					1			1												1																						
Preparation room								1																																		
Faculty cabin					5			3																	7																	
HOD cabin					1			1																																		
Balance Room								1																																		
Chemistry Lab					10			6		1																																
Computer cum Language lab UG26					9			8															1																			
Pharmacognosy Lab					12			8																							1											
Preparation room					2			1																																		
HAP lab UG29					12			7																																		
Cabin					1			1												1																						
Pharmaceutics Lab					12			6																																		
Cabin					1			1												1																						
Preparation room					1			1																																		
Machine Room					12			6																																		
Class Room 2					12			8												1																						

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Principle Office				9				3											1								1														
Central Instrumentation room					4			7											1								1														
Preparation room FF29					1			1																																	
Faculty cabin					1			1												1																				2	
Pharmaceutical Analysis Lab FF30					8			4		1																															
Class Room 5 FF31					4			7											1																						
Guest House First Floor Meeting Hall												16			9																									1	
Waiting Room								2				5			8														2												
Gallery													2																												
Kitchen								1				2			5																										
Toilet				1								8																													
Corridor				1								20	2	4																											
Second Floor Porch & corridor								2				27		4														1													
Room (04 Nos.)								4				20		16																											
Toilet				4								16																												4	
Gallery													4																												
Third Floor Corridor				1								9	2																												
Room (03 Nos.)				3				3				24	6	12																											
VIP room								2				5	1	8																										1	

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Name of Department	LED Panel (36W)	Spot Light (12W)	Hymus Tube Light (72W)	LED Tube (10 W)	LED Tube (20 W)	Tube (28 W)	Tube (40 W)	Fan	Wall fan	Exhaust Fan	LED Bulb Fitting (36 W)	LED bulb (5W)	LED bulb (9W)	LED bulb (10W)	LED bulb (12W)	LED bulb (15W)	LED bulb (18W)	Pedestal Fan	Projector	Computer	Refrigerator	Stability Chamber	UPS	Laptop	Calling light (15W)	Cooler	Printer	Xerox Machine	Scanner	AC	Freezer	Oven	Griller	Fryer	Mixer	Sound System (250W)	LED Screen	Incandescent Bulb					
Gallery														4																													
Fourth Floor Corridor				1									2																														
Porch												9																															
VIP room				1			2				8		8																														
Gallery													2																														
Room (03 Nos.)				3			3				2	4	6	1	2																												
Terrace												3					1																										
Entrance											5	10	2																														
Canteen swad aswad							17	8	1													2																					
Generator room					2			2	1																																1		
Sports Complex Sports Hall Badminton	10	30								10																																	
Table Tennis								1									52																										
Gymnasium	24																																										
Wash room																	10																										
Viewing Gallery Sports Hall									6								18																										
Music& Yoga	24															4																											
Staircase						8										30					1																						
Office					3											3						1																					



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Old Boys Hostel				99			66																		3															
New Boys Hostel					186		78					78													3															
Old Mess					5		3	2													1																			
New Mess						20	10	1													1				1															
Old Girls Hostel					179	15	85					88													3															
New Girls Hostel					224		112					224				66																								
Corridor																24										5														
Mess					20		6																		1															
<b>Total</b>	48	10	30	15	1091	35	17	670	1	19	24	422	166	44	88	207	1	2	7	46	6	1	2	17	254	23	13	1	1	8	5	3	1	1	1	3	6	3		
Solar Panel light (15 W )	25																																							
High mast lamp (150 x 8)	08																																							



### 3.5 Purpose of the Performance Test

Most interior lighting requirements are for meeting average luminance on a horizontal plane, either throughout the interior, or in specific areas within the interior combined with general lighting of lower value. The purpose of performance test is to calculate the installed efficacy in terms of lux/watt/m<sup>2</sup> (existing or design) for general lighting installation. The calculated value can be compared with the norms for specific types of interior installations for assessing improvement options. The installed load efficacy of an existing (or design) lighting installation can be as follows

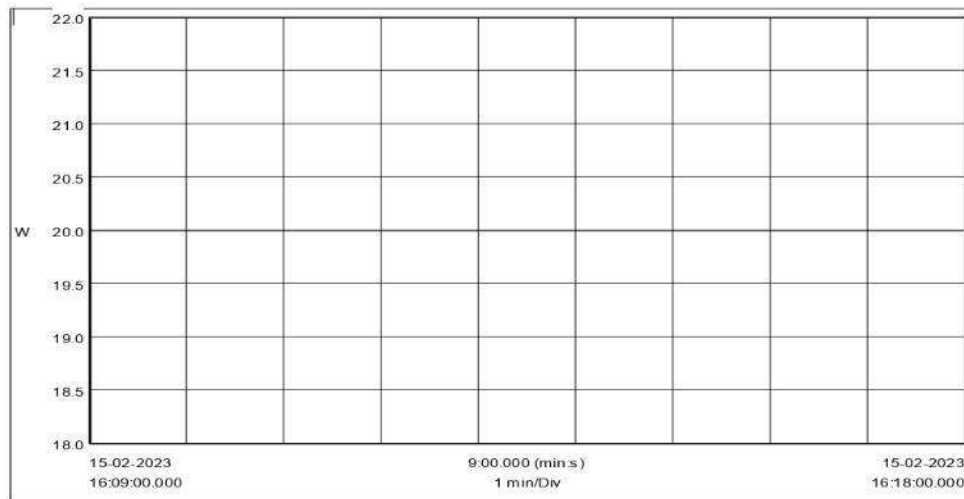


Figure 15: Power profile of LED tube light

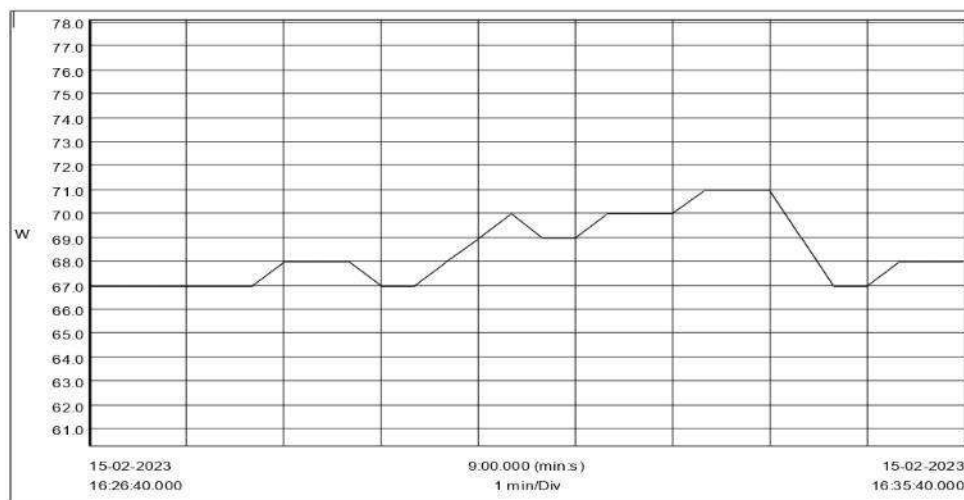


Figure 16: Power profile of fan (Luminous)

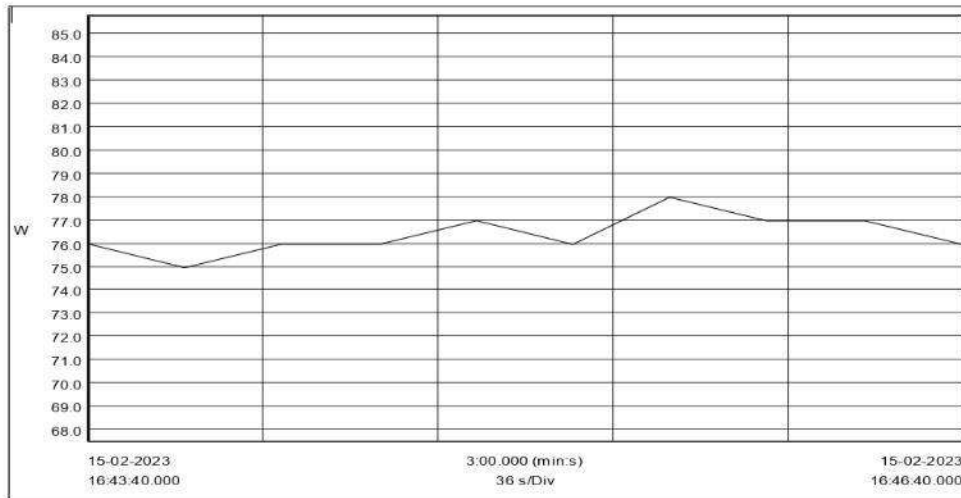


Figure 17: Power profile of fan (Crompton)



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**3.6 Calculation of Installed Load Efficiency Ratio**

**Table 10: Calculation of ILER**

Existing System

Title	Units	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
Name of Lab		Chemistry Lab	APHE Lab	Language Lab	Boys Common room	Machine Room	Pharmaceutics Lab	Cafeteria	Central Instrumentation Room	Class Room FF21	Class Room FF17
Length of interior	Meter	11.65	11.7	11.7	12.3	11.72	12.6	26.7	11.9	11.8	11.7
Width of interior	Meter	8.7	8.7	8.6	12	8.8	8.7	11.15	8.7	8.7	8.7
Mounting height	Meter	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Floor area of interior	Meter <sup>2</sup>	101.36	101.79	100.62	147.60	103.14	109.62	297.71	103.53	102.66	101.79
Room Index	No	1.99	2.00	1.98	2.43	2.01	2.06	3.15	2.01	2.00	2.00
No of light fittings	No	12	13	12	12	12	12	10	4	8	8
Total circuit watts	Watt	240	260	240	240	240	240	200	80	160	160
Watts per square meter	W/m <sup>2</sup>	2.4	2.6	2.4	1.6	2.3	2.2	0.7	0.8	1.6	1.6
Average maintained luminance	Lux	341.82	389.00	350.87	305.38	213.36	249.00	636.17	321.90	163.80	180.64
Actual lux per watt per meter square	Lux/W/m <sup>2</sup>	144.35	152.29	147.10	187.81	91.69	113.73	946.95	416.58	105.10	114.92
Target lux/W/m <sup>2</sup> lux for type of the type of interior	Lux/W/m <sup>2</sup>	46	46	46	48	46	46	50	46	46	46
Installed load efficiency ratio	ILER	3.14	3.31	3.20	3.91	1.99	2.47	18.94	9.06	2.28	2.50

- ILER ratio is satisfactory above 0.75 value.
- ILER ratio varies from 1.99 to 18.94





#### 4. Energy Conservation Measures

##### 4.1 Replacing the Conventional fan with energy efficient fan

###### Findings:

The conventional fan consumes average 65 W energy.

###### Recommendations:

Replace the conventional fan with energy efficient fan which consume less energy.

###### Benefits:

The cost benefit analysis of replacing energy efficient fan is given below.

**Table 11: Cost benefit analysis of replacing the energy efficient fan**

Description	Units	Value	Value	Value	Value
<b>Present system</b>					
Type of fan	-	Ceiling fan	Wall fan	Pedestal fan	Exhaust fan
Number of existing fan	Nos	670	1	2	19
Wattage /fan	Watt	65	65	65	65
Usage of fan per day	Hrs	8	8	8	8
Working days per annum	Days	300	300	300	300
Annual Energy consumption	kWh	104520	156	312	2964
<b>Proposed system</b>					
Recommended for replacement	%	50%	100%	100%	75%
Recommended of EE fan	Nos	335	1	2	14
Wattage of EE fan	Watt	28	29	30	31
Annual Energy consumption	kWh	22512	70	108	1060
Annual Power saving	kWh	29748	86	126	1163
Energy tariff	₹	14.64	14.64	14.64	14.64
Monitory saving	₹	435510.72	1264.90	1844.64	17023.39
Investment/fan	₹	2800	5440	5440	3760
Total investment	₹	938000	5440	8160	53580
Simple Payback period	Years	2.15	4.30	4.42	3.15
Reduction in CO <sub>2</sub> emissions	MT/year	24.39	0.07	0.10	0.95



#### 4.2 Replacing the Old Tube with LED tube

##### Findings:

Current existing tube light consumes 40 W which is replaced by LED tube.

##### Recommendations:

Replace the current tube light with LED tube which consumes less energy.

##### Benefits:

The cost benefit analysis of replacing current tube light with LED tube is given below.

**Table 12: Cost benefit analysis of replacing the current tube light with LED tube**

Description	Units	Value	Value
<b>Present system</b>			
Type of tube	-	28 W	40 W
Number of existing tube lights(T12/T8)	Nos	35	17
wattage /tube	Watt	28	40
Total wattage	Watt	980	680
Daily usage	Hrs/day	8	8
Annual working days	days/yr	240	240
Annual Energy consumption	kWh	1882	1306
<b>Proposed system</b>			
Recommended for replacement	%	75%	75%
Recommended of LED tube light	Nos	26	13
Wattage of LED tube light	Watt	20	20
Annual Energy consumption	kWh	1008	490
Annual Power saving	kWh	403	490
Energy tariff	₹	14.64	14.64
Monitory saving	₹	5902.85	7167.74
Investment/LED tube light	₹	225	225
Total investment	₹	5906.25	2868.75
Simple Payback period	Years	1.00	0.40
Reduction in CO <sub>2</sub> emissions	MT/year	0.33	0.40



### 4.3 Water Pumping System

#### Findings:

The submersible pump is use to supply the water for institute are more than 5 years old & power consumption of the pump is more than rated.

#### Recommendations:

Replace the existing pump with Energy Efficient water pump.

#### Benefits:

The cost benefit analysis is given below

**Table 13: Cost benefit analysis of replacing EE water pump**

Description	Unit	Pump for New ladies hostel	Old Ladies hostel	Pump for sump	RO plant	Pharmacy building
<b>Present System</b>						
Make	-	Texmo	Texmo	Texmo	Texmo	Texmo
Power	HP	5	3	3	2	5
	kW	3.73	2.238	2.238	1.492	3.73
Measured power	kW	3.804	3.814	3.338	2.349	3.83
Type	-	Submersible	Submersible	Submersible	Submersible	Submersible
<b>Proposed System</b>						
Proposed power	kW	2.2	1.32	2.2	1.32	2.2
Daily usage	Hr/day	8	13	11	4	5
Annual working days	Days/yr	300	300	300	300	300
Estimated power saving	kWh	1.604	2.494	1.138	1.029	1.63
Annual power saving	kWh	3850	9727	3755	1235	2445
Energy tariff	₹/kWh	14.64	14.64	14.64	14.64	14.64
Monetary saving	₹	56358	142397	54979	18077	35795
Total investment	₹	57248	41124	41124	41124	57148
Simple payback period	Yr	1.02	0.29	0.75	2.27	1.60
Reduction in CO <sub>2</sub> Emission	MT/Yr.	3.16	7.98	3.08	1.01	2.00

### 4.5 Design Solar PV Grid Rooftop System

**Table 15: Solar PV Grid Rooftop System**

Name of Building	Annual Electricity Consumption kWh	Daily Electricity Consumption kWh	Unit Charge	Solar PV System Required-kW <sub>p</sub>	Annual Electricity Generated by Solar kWh	Monetary Saving □	Investment @60000/kw <sub>p</sub>	Simple Payback
Pharmacy College	181580	497.48	14.64	166	161850	2369484.00	9960000	4.20





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**Annasaheb Dange College of B. Pharmacy, Ashta**

Ashta, Tal: Walwa, Dist: Sangli, Maharashtra, India – 416301



Annasaheb Dange College of B Pharmacy, Ashta

Energy Audit Report 2022-23

**Suppliers of Energy Efficient Appliances/Renewable Energy Product**

Sr. No.	Product Name	Vendor Details
1	LED tube light	<p><b>Syska LED</b> Syska House Plot No. 89-91, Lane No. 4 Sr. No. 232, 1/2, Airport Road, Sakore Nagar, Lohegaon, Pune, Maharashtra 411014 Email : <a href="mailto:support@syska.co.in">support@syska.co.in</a> Website : <a href="https://syska.co.in/">https://syska.co.in/</a></p>
2	Energy Efficient Fan	<p><b>Atomberg Technologies</b> Plot No. 130 B, TTC industrial area, Shirawane, Navi-Mumbai, Maharashtra - 400706 Email : <a href="mailto:sandeepencon@gmail.com">sandeepencon@gmail.com</a> Website : <a href="https://atomberg.com/">https://atomberg.com/</a></p>
3	Water Pump	<p><b>Grundfos</b> <b>Vakratund Enterprises</b> P-12, Shop No. 3/4 SAMK Building, Shiroli, Kolhapur, Maharashtra - 416122 Email: <a href="mailto:kishor.u@vakratudent.com">kishor.u@vakratudent.com</a> Mobile : +91 9922959080</p>
4	Solar Water Heater/ Solar PV system	<p><b>Affordable Solar Energy Pvt. Ltd</b> 202, B Wing, Anant Park, Main Kalewadi Road, Rahatni, Pune, Maharashtra, 411029, India Email: <a href="mailto:info@affordableenergy.in">info@affordableenergy.in</a> Website: <a href="http://www.affordableenergy.in">www.affordableenergy.in</a> Mobile: 8380014555, 7020389630, 9158509935</p> <p><b>Photon Energy Systems Limited</b> Plot 26, Rd Number 10, Krishnapuram Colony Singada Kunta, Banjara Hills, Hyderabad, Telangana - 500034 Email : <a href="mailto:pradeep@photonsolar.in">pradeep@photonsolar.in</a> Website : <a href="https://photonsolar.in/">https://photonsolar.in/</a></p> <p><b>Jain Irrigation Systems Limited</b> Jain Plastic Park, N.H.No. 6 Bambhori Jalgaon, Maharashtra - 425001 Email : <a href="mailto:sandeepencon@gmail.com">sandeepencon@gmail.com</a> Website : <a href="https://www.jains.com/">https://www.jains.com/</a></p>
5	Air-conditioning	<p><b>Neptune Engineers</b> Ram prasad complex, Miraj road Near Chandani Chowk, Sangli, Maharashtra - 416416 Email : <a href="mailto:cak@hvacneptune.com">cak@hvacneptune.com</a> Mobile : +91 8308000299</p>
6	Heat Pump	<p><b>AO Smith</b> <b>Vakratund Enterprises</b> P-12, Shop No. 3/4 SAMK Building, Shiroli, Kolhapur, Maharashtra - 416122 Email: <a href="mailto:kishor.u@vakratudent.com">kishor.u@vakratudent.com</a> Mobile : +91 9922959080</p>

MEDA Empanelled Energy Auditor, SITCOE, Yadrav.

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**3. Certificate of External Expert of the accredited Institution**



**ऊर्जा दक्षता ब्यूरो**

(भारत सरकार, विद्युत मंत्रालय)

**BUREAU OF ENERGY EFFICIENCY**

(Government of India, Ministry of Power)



10/02/Accred./BEE/21

25<sup>th</sup> November, 2021

Dr. Sanjay Annaso Khot  
Sharad Institute of Technology College of Engineering Yadrav,  
16/1385, Near- Dr Dhavale Hospital,  
Kolhapur Road, ICHALKARANJI  
Dist- Kolhapur, MS- 416115

**Sub: Application for accreditation as accredited energy auditors- reg.**

**विषय: मान्यता प्राप्त ऊर्जा लेखा परीक्षकों के रूप में मान्यता के लिए आवेदन**

Sir,  
महोदय,

The undersigned is to refer to your application for the accreditation of Energy Auditors and the subsequent Oral interview you had before the Accreditation Advisory Committee on 05<sup>th</sup> August, 2021 at BEE office, New Delhi.

प्रत्यायन सलाहकार समिति के समक्ष ऊर्जा लेखा परीक्षकों की मान्यता के लिए आपका आवेदन और उसके बाद के मौखिक साक्षात्कार के लिए आपका आवेदन 05 अगस्त, 2021 को ऊर्जा दक्षता ब्यूरो कार्यालय, नई दिल्ली में किया गया।

We are pleased to inform that the Accreditation Advisory Committee has recommended your name for the accreditation as Accredited Energy Auditor in **Textile, Sugar & Food Processing Sector**. Your name will be included in the list of Accredited Energy Auditor for these Sectors, maintained by BEE on its website ([www.beeindia.gov.in](http://www.beeindia.gov.in)).

हमें यह बताते हुए प्रसन्नता हो रही है कि प्रत्यायन सलाहकार समिति ने मान्यता के लिए आपके नाम की सिफारिश कपड़ा, चीनी और खाद्य प्रसंस्करण क्षेत्र में मान्यता प्राप्त ऊर्जा लेखा परीक्षक के रूप में की है। आपके नाम को ऊर्जा दक्षता ब्यूरो द्वारा अपनी वेबसाइट ([www.beeindia.gov.in](http://www.beeindia.gov.in)) पर अनुरक्षित मान्यता प्राप्त ऊर्जा लेखा परीक्षक की सूची में शामिल किया जाएगा।

भवदीय

(रजनी थॉमसन)

समन्वयक (परीक्षा)

स्वहित एवं राष्ट्रहित में ऊर्जा बचाएँ Save Energy for Benefit of Self and Nation

चौथा तल, सेवा भवन, आर० के० पुरम, नई दिल्ली-110 066, वेबसाइट/Website : [www.beeindia.gov.in](http://www.beeindia.gov.in)  
4th Floor, Sewa Bhawan, R.K. Puram, New Delhi-110 066 टेली/Tel.: 91 (11) 26766700, फ़ैक्स/Fax: 91 (11) 26178352





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**MAHARASHTRA ENERGY DEVELOPMENT AGENCY**



**Maharashtra Energy Development Agency**

(A Government of Maharashtra undertaking)

Aundh Road, Opposite Spicer College,

Near Commissionerate of Animal Husbandry, Aundh, Pune – 411 067

Ph No: 020-26614393/266144403

Email: [eee@mahaurja.com](mailto:eee@mahaurja.com), Web: [www.mahaurja.com](http://www.mahaurja.com)

ECN/2021-22/CR-09/1535

15<sup>th</sup> April, 2021

**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. Sharad Institute of Technology College of Engineering Yadrav, Ichalkaranji, Tal.-Shirol, Dist.- Kolhapur – 416 421.

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

**Registration Number** : *MEDA/ECN/2021-22/Class A/EA-29*

- 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 **14<sup>th</sup> April, 2023** 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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**Annasaheb Dange College of B. Pharmacy, Ashta**

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**DVV Query 3- Justification**

**Certificate from the auditing agency of Energy audit.**



Shri Shamrao Patil (Yadravkar) Educational & Charitable Trust's

**SHARAD INSTITUTE OF TECHNOLOGY COLLEGE OF ENGINEERING**

An Autonomous Institute Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere

Approved by AICTE, New Delhi, Recognized by DTE, Government of Maharashtra

■ NBA Accredited Programmes ■ Accredited by NAAC with 'A' Grade ■ An ISO 9001:2015 Certified Institute

**Dr. S. A. Khot**  
Principal

**Shri. Anil A. Bagane**  
Executive Director

**Dr. Rajendra Patil (Yadravkar)**  
Chairman

Ref. No. : -SITCOE/EA/2022-23/ 636/1

Date: -17/02/2023

**Certificate**

This is to certify that, a detailed energy audit of Annasaheb Dange College of B Pharmacy has been conducted in February 2023 as per the guidelines of BEE New Delhi and MEDA Pune. The outcome of the implementation of the said energy audit would result in energy conservation of 32 % which will be a substantial achievement. The said energy audit is a compilation of the data provided by the organization. The same has been measured and verified during the visit with calibrated energy audit instruments. This is also to inform you that energy conservation measures recommended by us have been accepted by Annasaheb Dange College of B Pharmacy, Ashta.

Place: - Yadrav  
Date: -17/02/2023

Dr. S. A. Khot  
Principal  
Accredited Energy Auditor  
(AEA 0312)



Address : Behind Onkareshwar Temple, Yadrav (Ichalkaranji) - 416 121 Tal. Shirol, Dist. Kolhapur (M.S.) INDIA  
Ph. : (02322) 253000, 253001 Fax. : (02322) 252897, E-mail : contact@sitcoe.org.in , Website : www.sitcoe.ac.in