INVENTUM POWER PRIVATE LIMITED

B-BLOCK, PLOT NO.-52, SEC-64, NOIDA, UP-201301
www.inventumpower.com

IPPL/ENA/DEC/2023/01

ENERGY AUDIT CERTIFICATE

This is to certify that,
a detailed **Energy Audit** has been conducted in

ITS Engineering College

GREATER NOIDA, UTTAR PRADESH, INDIA

during 4th & 5th December-2023.
The institute has been maintaining best Electrical System, Efficient Lighting, Fan & Air Conditioning System & best in use of LPG system.

MR. R. K. AGGARWAL
BEE CERTIFIED ENERGY AUDITOR
AUDITOR

INVENTUM POWER PVT. LTD. DELHI

MR. J. K. SHARMA
DIRECTOR

INVENTUM POWER PRIVATE LIMITED

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IPPL/GRA/DEC/2023/01

GREEN AUDIT CERTIFICATE

This is to certify that,
a detailed **Green Audit** has been conducted in

ITS Engineering College

GREATER NOIDA, UTTAR PRADESH, INDIA

during 4th to 5th December-2023.
The institute has been astonishing diversity of trees, redefining its green culture and develop new paradigm for flora & fauna.

MR. R. K. AGGARWAL
BEE CERTIFIED ENERGY AUDITOR
AUDITOR

INVENTUM POWER PVT. LTD. DELHI

MR. J. K. SHARMA
DIRECTOR

DEC. 2023

ENERGY, ENVIRONMENT & GREEN AUDIT REPORT OF

ITS ENGINEERING COLLEGE,

46, Knowledge Park-III, Greater Noida- 201308, U.P. India

Submitted by-

INVENTUM POWER PRIVATE LIMITED

(B-52, Sector 64, Noida, Uttar Pradesh – 201301)

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DISCLAIMER

This report is based on the information provided from the facility & on-site observations on specific dates. We certify that this information and following analysis is correct to the best of our knowledge and ability. The validity of the recommendations is dependent on field measurement and historical data supplied to us. This report (including any enclosures and attachments) has been prepared for the exclusive use and benefit of the addressee(s) and solely for the purpose for which it is provided. Unless we provide express prior written consent, no part of this report should be reproduced, distributed or communicated to any third party. We do not accept any liability if this report is used for an alternative purpose from which it is intended, nor to any third party in respect of this report. The recommendations and findings are to be used by client at their own accord and Inventum Power Private Limited or its associates would not be responsible for any material or non-material losses (if any) occurring in any way due to their implementation.

Proposed Recommendations and potential savings are based on the analysis done during the audit period and hold no relevance if any changes in the present electrical network at site is done.

ACKNOWLEDGEMENT

INVENTUM POWER PVT LTD expresses its sincere thanks to the Management of **M/S ITS Engineering College, Greater NOIDA** for giving us an opportunity to undertake an **Energy Audit** in their esteemed organisation for providing our findings/ Recommendations for overall improvement.

We are Heartily thankful to **Mr. Vinod Chand, Administrator** for His keen interest in energy conservation which is really in National interest. We also really appreciate his dedication towards cost reduction and safety approaches in the college building. We also appreciate that He has visualized the idea of identifying possible energy saving potential in ITS engineering college, Greater Noida

We are extremely thankful to **Mr. Chander Shekhar, Electrical supervisor for** his valuable help & guidance, help in all type of shop floor measurements during the audit study.

We are also thankful **Mr. Saurav Kumar, Electrician for** his help during day to day measurements during entire energy audit.

We are indeed touched by the helpful attitude and co-operation of all technical staff who rendered their valuable assistance and co-operation during the course of study.

FOR INVENTUM POWER PVT. LTD.

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1. INTRODUCTION

ABOUT ITS, GREATER NOIDA

The ITS engineering college is established in the year 2006 and Situated in Greater Noida, Uttar Pradesh, the **ITS Engineering College (ITSEC)** has regularly churned out talented students, who have been offered numerous job offers during the final years of their courses. Equipped with facilities such as a robust infrastructure, innovative teaching pedagogies, experienced teachers and guidance counsellors as well as provisions to provide the students with ample practical experience, this institute witnesses student applications not only from across the country but also from students across the globe. As a result, the student intake at this premier university has been on the constant rise.

Being an institute that primarily specializes in the engineering domain, students are given the opportunity to specialize in various fields such as chemical engineering, computer science and engineering, etc., with a lateral entry option provided to them as well. In order to receive admission into this course, students are required to submit the scores received on the UPSEE test. ITS Engineering College Greater Noida also offers candidates the option to pursue an MBA, for which they will be required to appear in national levels entrance examinations such as CAT and MAT.

The **ITS Engineering College** hosts a spectacular website, which contains information regarding the courses and other such details. It also contains the application form for each program, with students can download and save in order to submit the same for consideration. Students will be able to create their own accounts on the website after entering a few credentials, and then they will be able to pursue the entire application process online.

It is a pleasure to share with you that ITS Engineering College is recognized in the band "**EXCELLENT**" under the category "Colleges/ Institutes (Private/ Self-Financed- Technical)" in ATAL RANKING OF INSTITUTIONS ON INNOVATION ACHIEVEMENT **(ARIIA) 2021**, Ministry of Education, Government of India.

Awards & Honors

• CSR Excellence in Education Award by Competition Success Review in 2020.
• Best Leadership Entrepreneur Kotler Award to honorable Vice Chairman Mr. Sohil Chadha by Kotler Awards.
•Education Excellence Award by Women Innovation Entrepreneurship Foundation.
• Effective Practices for incubation center by B Tech colleges by Elets Techno media Pvt Ltd.
• Asia Pacific Education Excellence Award by Assocham India.
• Best Industry Interface Award by Royal Brands Pvt Ltd.

- India's Best B School Certificate from 4Ps Business & Marketing
- Listed in Best Private Engineering Colleges in North India by India Today.
- Overall Ranking 3rd in UP Ranked by Chronicle of Career & Education.
- Ranked 2nd in Outstanding Engineering Colleges by Competition Success Review.

Accreditation & Recognitions

- National assessment and accreditation council (NAAC)
- National Board of Accreditation (NBA)
- All India Council for technical education (AICTE)
- Dr. A.P.J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

OBJECTIVE OF ENERGY AUDIT

Energy audit is the key to a systematic approach for decision-making in the area of energy management and gives a positive orientation to the energy resource cost reduction. The primary objective of the energy audit is to determine ways to reduce energy consumption to lower operating costs.

The Energy audit at **ITS, Greater NOIDA** is conducted with the following Objectives:

- ❖ Quantification of Energy Losses, and Energy Saving Potential.
- ❖ Presentations of Energy Efficiency Measures with cost benefit analysis.
- ❖ Identifying potential areas of electrical energy economy.
- ❖ Performance analysis of utility equipment.

ABOUT INVETUM POWER

Inventum Power Private Limited is care rated BEE Certified ESCO (Energy service Company) registered under Gov. of India the Ministry of Power, And ISO 9001: 2015 certified companies along with international collaboration with Elspec ISRAEL. Our technology simplifies the understanding of the quality of power itself, is highly compatible & helps our customers enhance electrical network power quality. Our innovations can be found in almost any sector, spanning from the industrial, commercial to the utility sectors. Some of the more substantial installations include.

ABOUT AUDIT TEAM MEMBERS

We have dedicated and expert team for services. Your first point of contact with Inventum Power care will be with our dedicated customer services team. We are highly skilled, motivated and fully trained to assist you. Our services team includes our expert, highly experienced advisors for power factor correction systems, harmonic filter and others Energy and Power Quality problems who have over 40 years combined experience for the same. Each team member is dedicated to offering

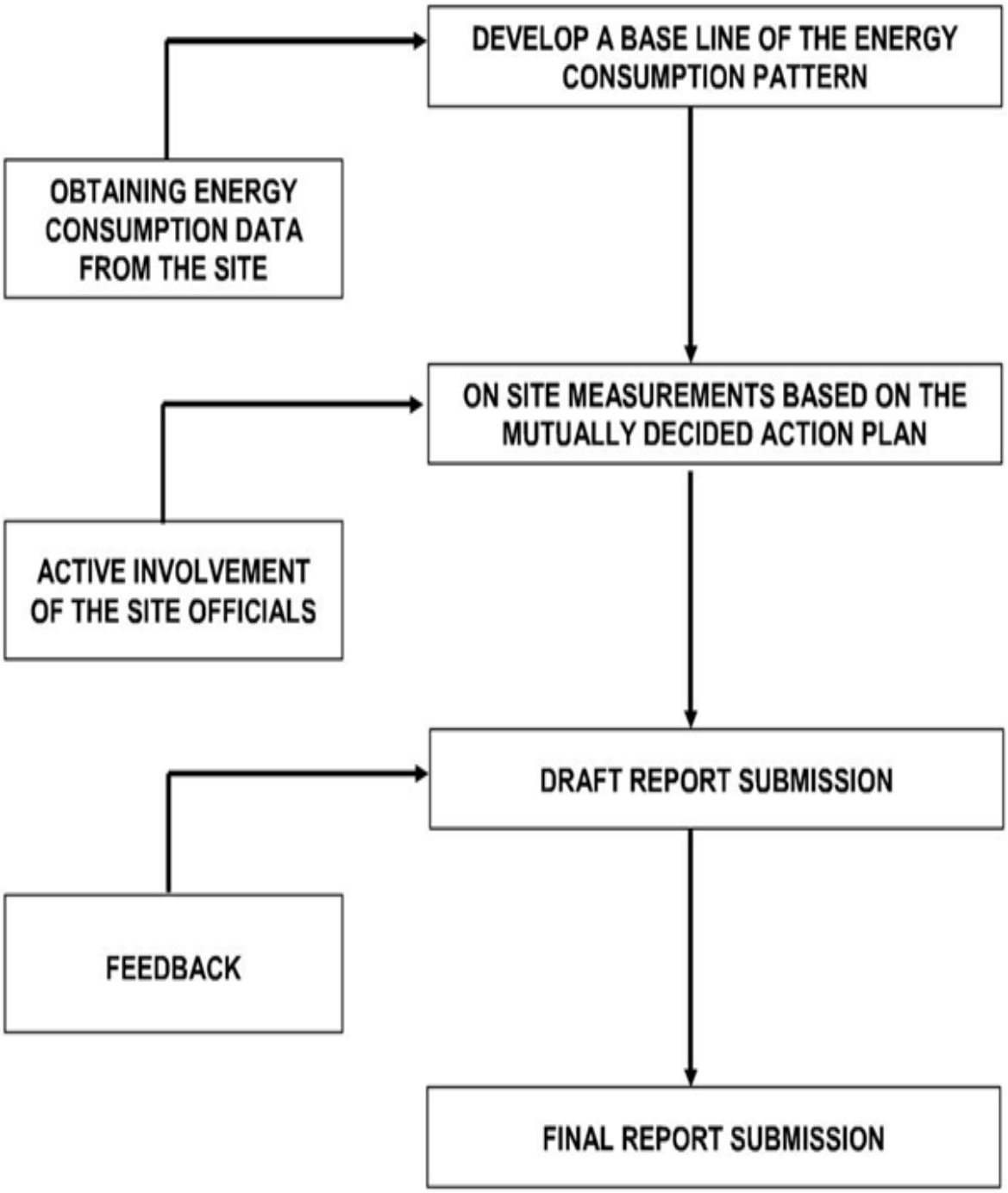
a high level of customer care and also strives for excellence to ensure that you receive the perfect service. The team members are as follows:

- **Mr. J K Sharma - HOD- Audit**
- **Mr. Md. Shahrukh Khan - HOD-PQA**
- **Mr. Ajay Jain - BEE Certified Energy Manager**
- **Mr. R K Aggarwal - BEE Certified Energy Auditor**
- **Mr. Ashish Sharma - Executive Engineer**
- **Mr. Mukesh Jha - Executive Engineer**
- **Mr. Abhinav Vishwakarma- Executive Engineer**

METHODOLOGY OF WORK

The methodology adopted for this audit was:

- A preliminary energy audit has been conducted to establish the energy consumption of the organization by analyzing the available past energy consumption data, identification of the areas requiring more detailed study and measurements.
- Visual inspection and data collection.
- Identification/verification of energy consumption and other parameters by measurements.
- Computation and in-depth analysis of the collected data, including utilization of computerized analysis and other techniques as appropriate were done to draw inferences and to evolve suitable energy conservation plan/s for improvements/ reduction in specific energy consumption.
- Potential energy saving opportunities.
- Flow Chart for Methodology for report preparation.


DEVELOP A BASE LINE OF THE ENERGY CONSUMPTION PATTERN
OBTAINING ENERGY CONSUMPTION DATA FROM THE SITE
ON SITE MEASUREMENTS BASED ON THE MUTUALLY DECIDED ACTION PLAN
ACTIVE INVOLVEMENT OF THE SITE OFFICIALS
DRAFT REPORT SUBMISSION
FEEDBACK
FINAL REPORT SUBMISSION

LIST OF INSTRUMENTS

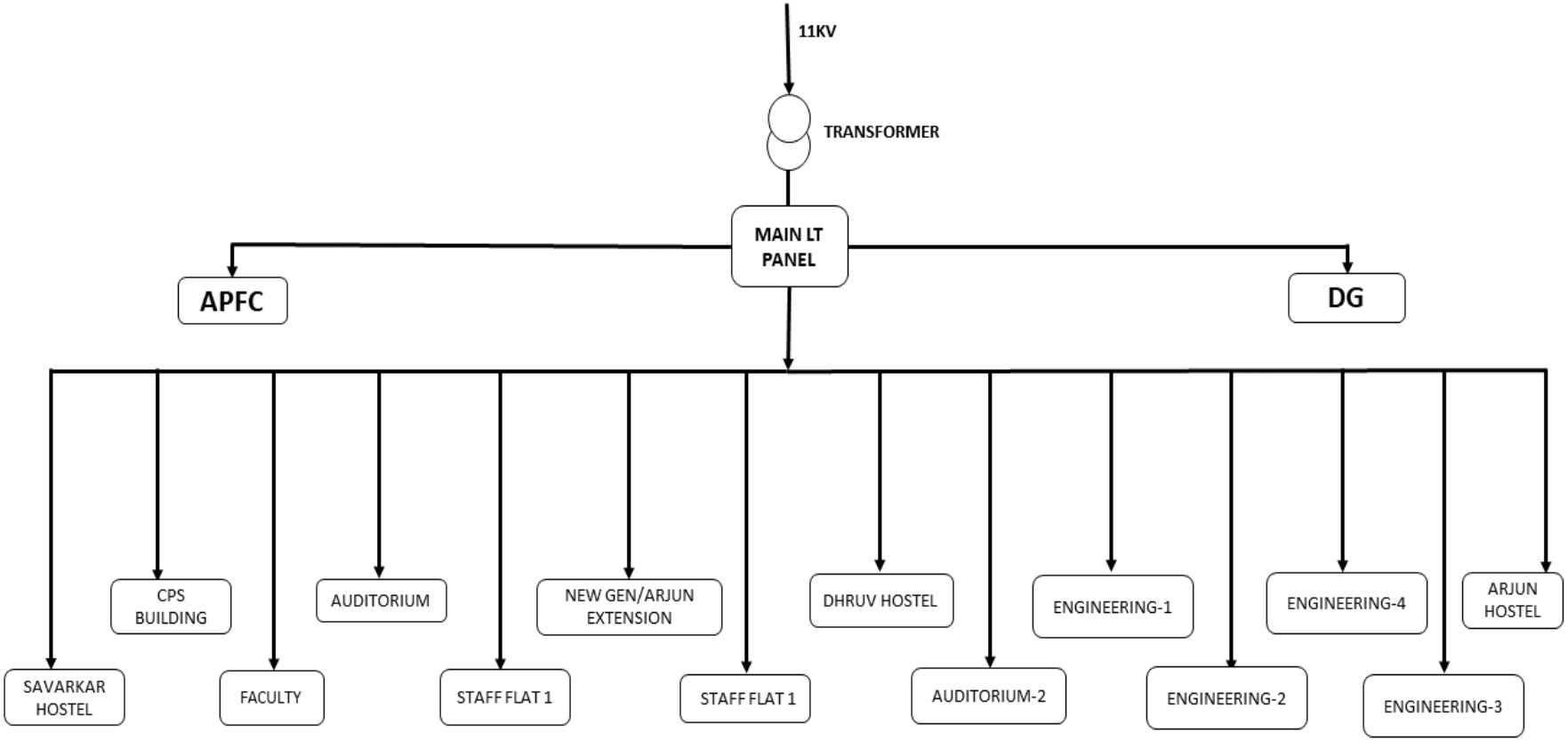
- 3 Phase Power Analyzer-Fluke 1736
- Ultrasonic Water flow meter
- Power Clamp
- Distance Meter
- Anemometer
- Hygrometer
- Thermal Camera
- Lux meter
- Others as per required

Figure 1: Energy Audit Instruments

GENERAL DETAILS

1	**Name of the Organization**	:	**ITS Engineering college, Greater Noida**
2	**Telephone No.**	:	**7840094635**
3	**Fax No.**	:	**NA**
4	**Name of the concerned officers**	:	**Mr. Vinod Kumar**
5	**Period of Audit**	:	**28.12.2023 – 29.12.2023**
6	**Services**	:	**Education Institute**
7	**Annual power consumption**	:	**8,74,085 Kvah**
8	**Annual power generated from DG set**	:	**9721 KWH**
9	**Annual solar power Generated**	:	**1,36,741 KWH**
10	**Connection type**	:	**11 KV HT**
11	**Contract Demand**	:	**389 KVA**
12	**Occupancy**	:	**NA**
13	**No. of DG sets**	:	**1 x 500 + 1 x 82.5 KVA**
14	**No. of Transformer**	:	**1 No. of 500 KVA**
15	**Electricity supply received**	:	**11 KV Feeder from NPCL**

SINGLE LINE DIAGRAM (SLD)



2. EXECUTIVE SUMMARY

S. No	Energy Conservation Projects	Annual Energy Saving (Units)	Annual Monetary Saving (INR)	Investment (INR)	Payback (Months)
1	Energy Saving by Improving Power Factor Close to Unity	22695	188824	3,00,000	1.5
5	Energy Saving by replacing old type CFL with new energy efficient LED light panel.	15124	125838	205500	1.6
11	Energy saving in lighting by replacing existing inefficient T-5 TL with LED Tube lights	30130	250681	163750	0.65
	Total	67949	₹ 565343	₹ 669250	3.75

Total Monetary Saving @ Rs.8.32/kVAh :Rs. 669250 / Year

Total Energy Cost of Facility : Rs. 7303856 / Year

Total Percentage Monetary Saving : 9.16%

ELECTRICITY BILL ANALYSIS

INTRODUCTION

During energy Audit, we have represented our energy bill analysis in this chapter. The energy audit analysis includes electricity bill analysis that delivers the proportionate use of each different energy source when compared to the total energy bill. The total amount on the energy bill puts an upper limit on the amount of money that can be saved.

ELECTRICITY BILL ANALYSIS

We have studied the electricity bills of last 12 months from Nov. 2022 to Oct. 2023 of the facility and have presented trends for various parameters like monthly kvah consumption, Power Factor, Maximum demand & Energy charge etc. The table represents month wise unit consumption, power factor maintained at site, fixed charges and energy charges paid by the client. We have also calculated the month wise per unit cost to the organization and found that the overall per unit cost is coming around Rs. 10.36 and varying month to month in the range of Rs. 9.52 to 11.79. The details are given in the report. The electricity tariff are as follows:

Contracted demand	:	389 KVA
Billable demand	:	75 % of contacted demand
Demand charges	:	Rs. 438 per KVA
Energy charges	:	Rs. 8.32 per unit (Kvah)
Annual Actual per unit cost	:	Rs. 10.36

In addition of the above, electricity duty is also charged and regulatory discount @10% is also provided in the bill.

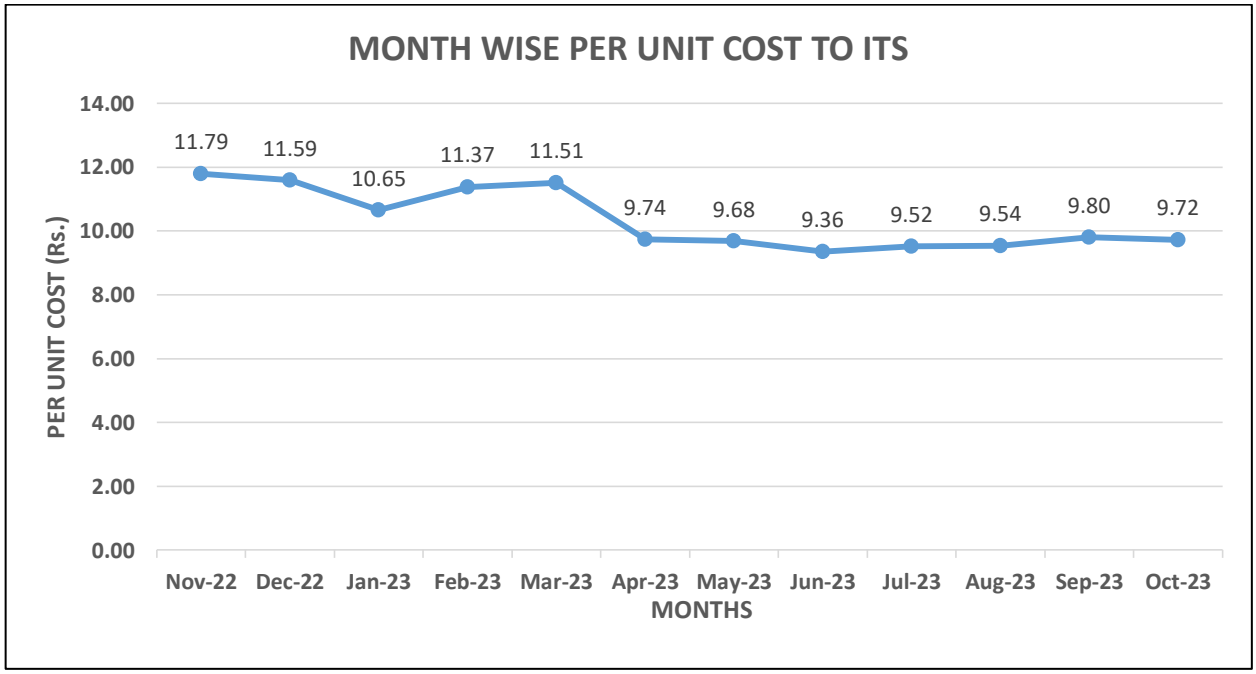
The details of electricity bill analysis are mentioned below:

ELECTRICITY BILL ANALYSIS

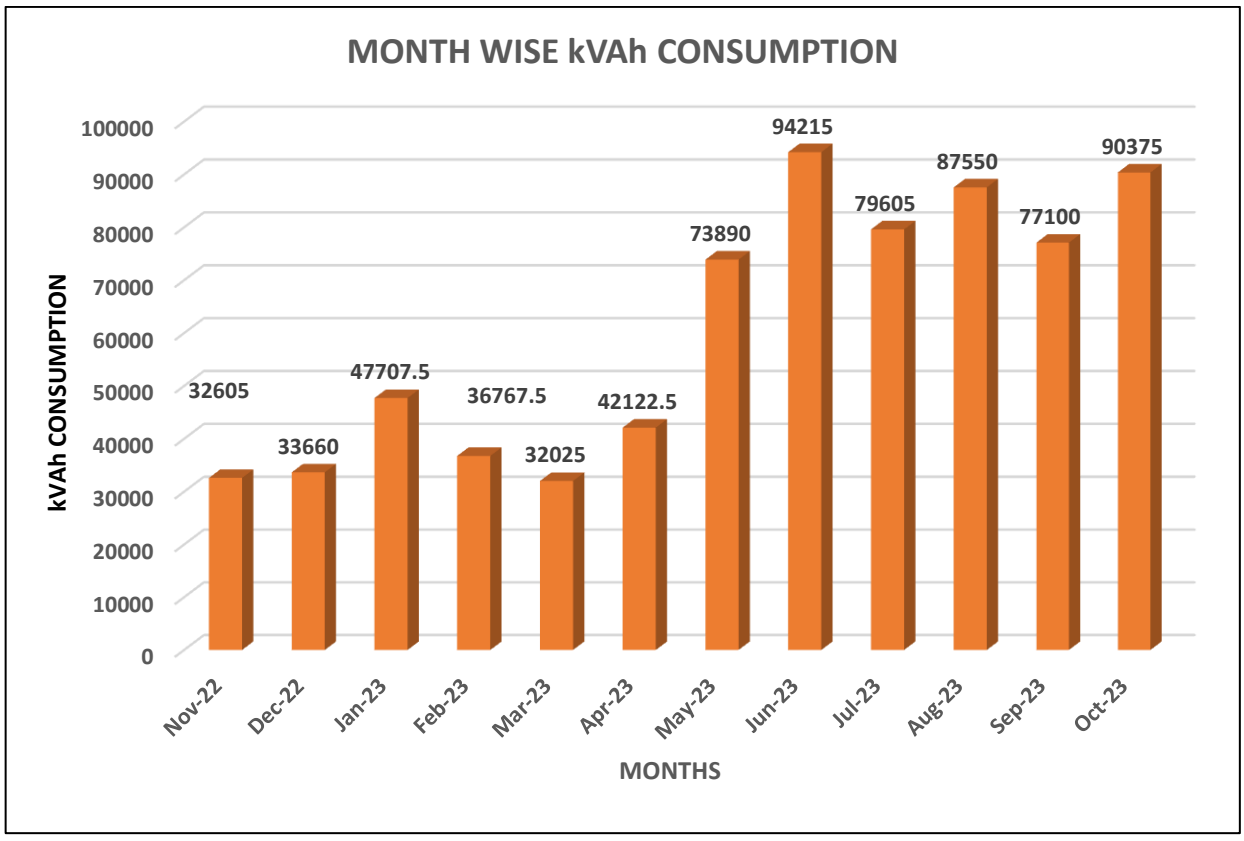
Month	Sanctioned Load (KVA)	MDI (KVA)	Billable Demand (KVA)	KWH	KVAH	PF	Energy Charges	Fixed Charges	Electricity Duty	Total	per unit cost
Nov-22	389	89.4	291.75	32310	32605	0.991	₹ 271,273.60	127,858.44	₹ 29,934.90	₹ 384,536.00	11.79
Dec-22	389	96	291.75	33345	33660	0.991	₹ 280,051.20	123,733.97	₹ 30,283.89	₹ 390,084.00	11.59
Jan-23	389	129.6	291.75	47462.5	47707.5	0.995	₹ 396,926.40	127,858.44	₹ 39,358.86	₹ 508,017.00	10.65
Feb-23	389	97.5	291.75	36370	36767.5	0.989	₹ 305,905.60	127,858.44	₹ 32,532.30	₹ 418,180.00	11.37
Mar-23	389	117.8	291.75	31692.5	32025	0.990	₹ 266,448.00	115,485.04	₹ 28,644.98	₹ 368,465.00	11.51
Apr-23	389	274.4	291.75	41635	42122.5	0.988	₹ 350,459.20	127,858.44	₹ 35,873.82	₹ 410,345.00	9.74
May-23	389	289.1	291.75	69170	73890	0.936	₹ 614,764.80	123,733.97	₹ 55,387.41	₹ 715,253.00	9.68
Jun-23	389	264.2	291.75	84995	94215	0.902	₹ 783,868.80	127,858.44	₹ 68,379.54	₹ 881,549.00	9.36
Jul-23	389	234.3	291.75	77047.5	79605	0.968	₹ 662,313.60	123,733.97	₹ 58,953.57	₹ 757,890.00	9.52
Aug-23	389	309.1	291.75	85625	87550	0.978	₹ 728,416.00	135,462.02	₹ 64,790.85	₹ 835,178.00	9.54
Sep-23	389	323	291.75	75120	77100	0.974	₹ 641,472.00	141,553.64	₹ 58,726.92	₹ 755,646.00	9.80
Oct-23	389	369.2	291.75	88745	90375	0.982	₹ 751,920.00	156,581.26	₹ 68,137.59	₹ 878,713.00	9.72
Total	**389**	**216.13**	**291.75**	**703,518**	**727,623**	**0.972**	**₹ 6,053,819.20**	**₹ 1,559,576.07**	**₹ 571,004.63**	**₹ 7,303,856**	10.36

Analysis & comments:

The demand is nearly coming to contracted demand in summer months. as a precaution management can think about increasing demand in case of load expansion or install solar plant.



MONTH WISE PER UNIT COST



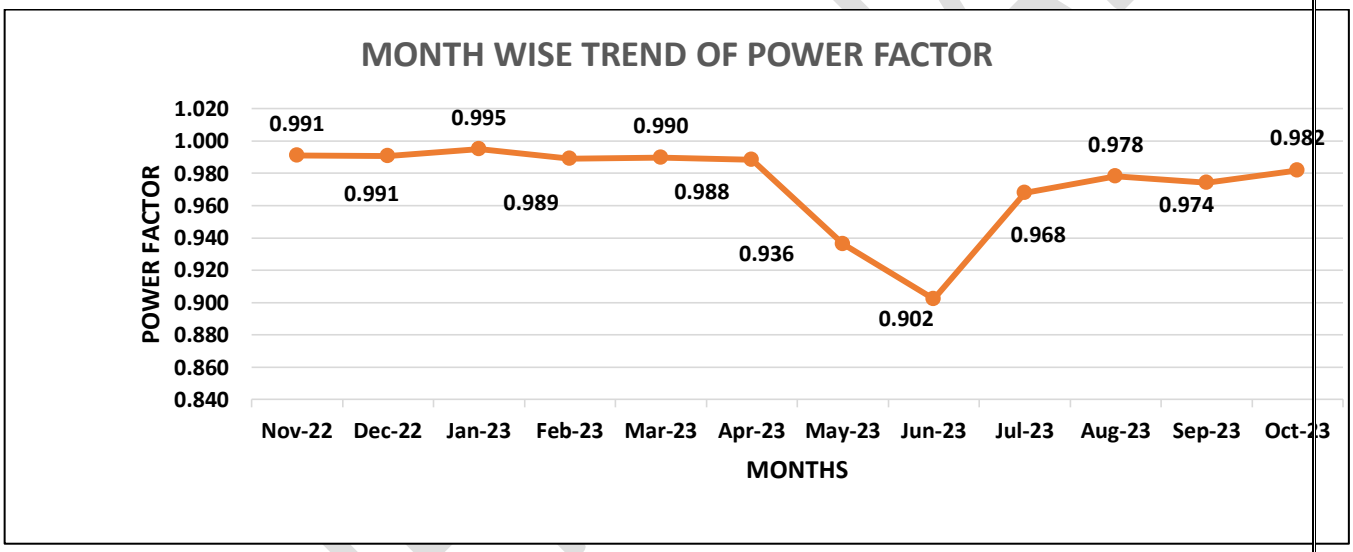
MONTH WISE KVAH CONSUMPTION

MAX.DEMAND AND POWER FACTOR ANALYSIS

POWER FACTOR

It is observed from the electricity bills that company is maintaining annual average power factor i.e.,0.974 and varying in the range of 0.902 to 0.995. it is quite appreciable that the company is maintain good power factor but still there is a scope of further improvement of power factor for energy saving. The billing is based on kVAh so power factor plays an important role i.e., as low as the power factor as high as will be the unit consumption. Now IGBT type APFC is available which help to improve the power factor near unity.

The month wise trend of power factor is as follows:



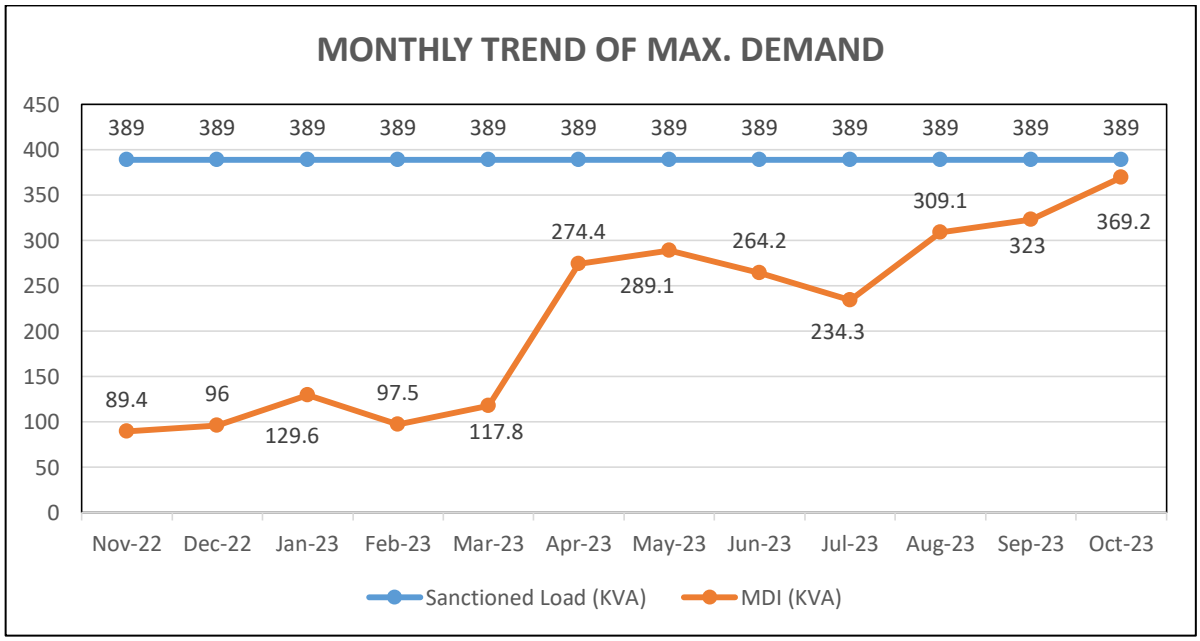
ECM-1 Scope of saving by improving power factor to near unity

Month	EXISTING P.F.	Existing KVAH	Proposed PF	Proposed KVAH	KVAh Saving	Monetary saving (Rs.)
Nov-22	0.991	32605	0.998	32375	230	1916
Dec-22	0.991	33660	0.998	33412	248	2065
Jan-23	0.995	47707.5	0.998	47558	150	1247
Feb-23	0.989	36767.5	0.998	36443	325	2701
Mar-23	0.990	32025	0.998	31756	269	2238
Apr-23	0.988	42122.5	0.998	41718	404	3362
May-23	0.936	73890	0.998	69309	4581	38117
Jun-23	0.902	94215	0.998	85165	9050	75293
Jul-23	0.968	79605	0.998	77202	2403	19994
Aug-23	0.978	87550	0.998	85797	1753	14588
Sep-23	0.974	77100	0.998	75271	1829	15221
Oct-23	0.982	90375	0.998	88923	1452	12082
	0.974	**727622.5**		**704927**	**22695**	**188824**

Existing unit consumption	:	727622 kVAh
Existing annul Power factor	:	0.974
Proposed power factor	:	0.998
Proposed unit consumption	:	704927
Expected annual power saving	:	22695 kVAh
Annual monetary saving@ Rs.8.32 per unit	:	Rs. 1,88,824
Approx. investment towards IGBT system	:	Rs. 3,00,000
Payback period	:	1.588 year

MAXIMUM DEMAND ANALYSIS

It is observed from the electricity bills that company is having contract demand of 389 KVA and Minimum payable demand is 75 % of the contracted demand i.e. 291.75 KVA. But from the bill, it is observed that ITS engg. college annual avg. demand is coming around 216 KVA and varying in the range of 89 to 369 KVA. The trend of Max. Demand as mentioned in below Table and diagram.



Analysis & comments:

It is seen from the above diagram that the demand is fluctuating in a wide range and in winter season, it comes near to contracted demand. So in case of load extension or low power factor, it can cross the contracted demand. So the management has to increase it by 100 KVA or install solar plant of 100kw.

CAPACITOR PERFORMANCE ANALYSIS

The ITS Engineering College Facility has installed One no's APFC (Automatic Power Factor controller) for improving power factor of 190 KVAR. During energy audit, the performance was analysed by measuring phase current on each phase, More or less all the capacitors are well maintained and performing good. The details of performance measurement are as follows:

APFC PANEL FOR TR-1 190 Kvar									
S. No	Capacitor Bank Rating	Rated Voltage (V)	Rated Current (A)	Current Value (A)			Average Current (A)	Derated (%)	Remarks
				R	Y	B			
1	10	415	14	12.5	11.3	12.1	11.97	14.52	ok
2	10	415	14						
3	15	415	21	17.2	17.9	16.9	17.33	17.46	ok
4	15	415	21	Not accessible to measure					
5	15	415	21						
6	25	415	35						
7	25	415	35						
8	25	415	35						
9	25	415	35						
10	25	415	35	31.3	30.9	31.5	31.23	10.76	ok

Note: Above most of the capacitor bank not accessible to measurement.

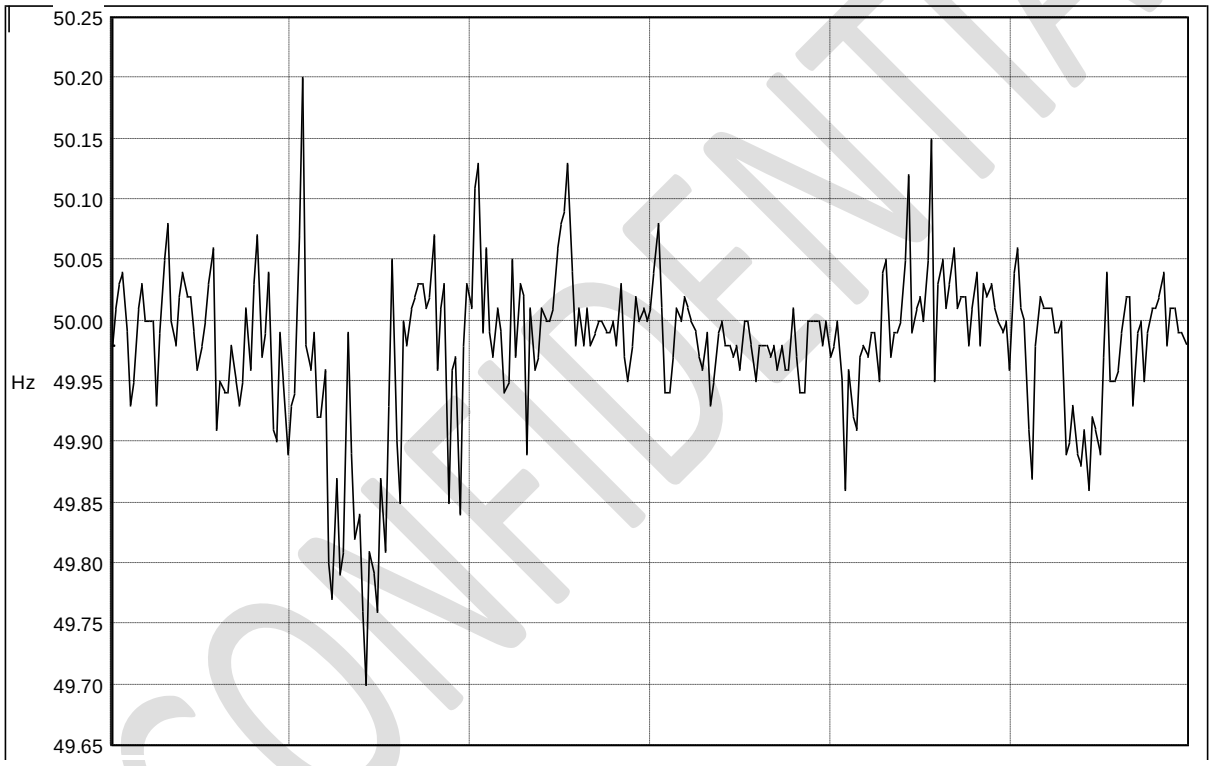
LOAD PROFILE & POWER QUALITY ANALYSIS

The ITS Engineering College has installed one transformer of 500 KVA (11/0.433 KV). The LT supply is going from transformer to Main LT panel and then further divided to different DBs/Feeders and going to different operation centre. During energy audit, the recording of 24 hrs. done at main LT incomer to record all the important load and power quality parameters i.e. voltage, active power (Kw), current, power factor, harmonics in current and voltage or THDi & THDv etc. the details of recordings are mentioned in graphical form and mentioned below for the reference.

GRAPHICAL TREND OF DIFFERENT PARAMETERS

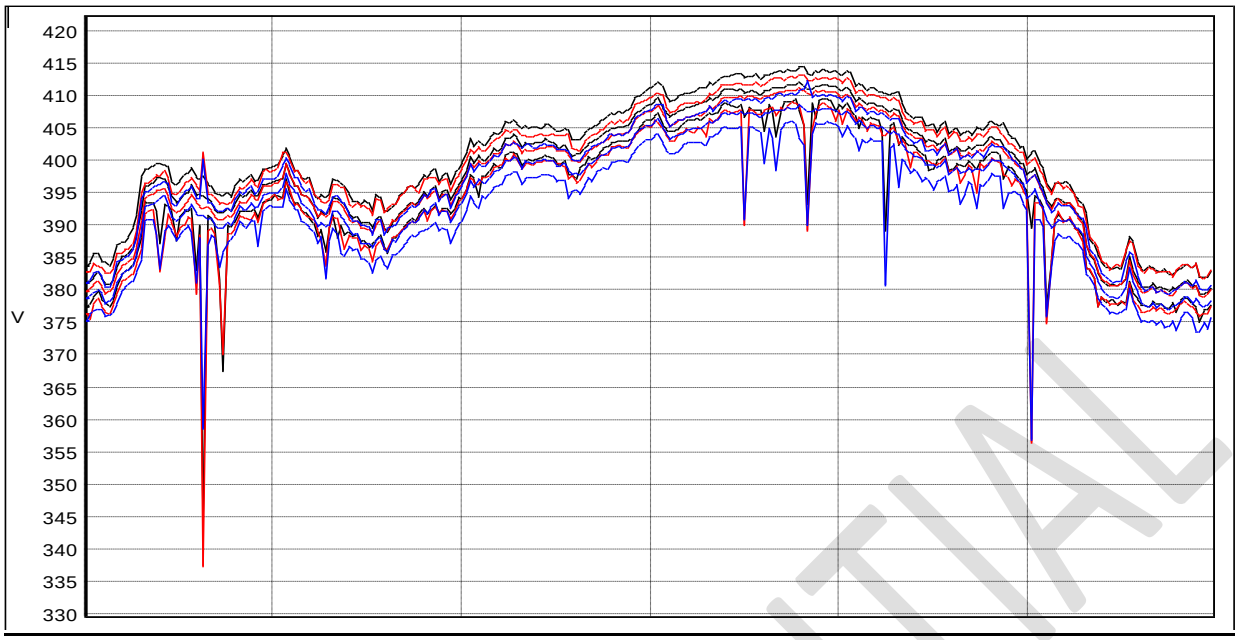
VCB MAIN INCOMER

Trends of Frequency



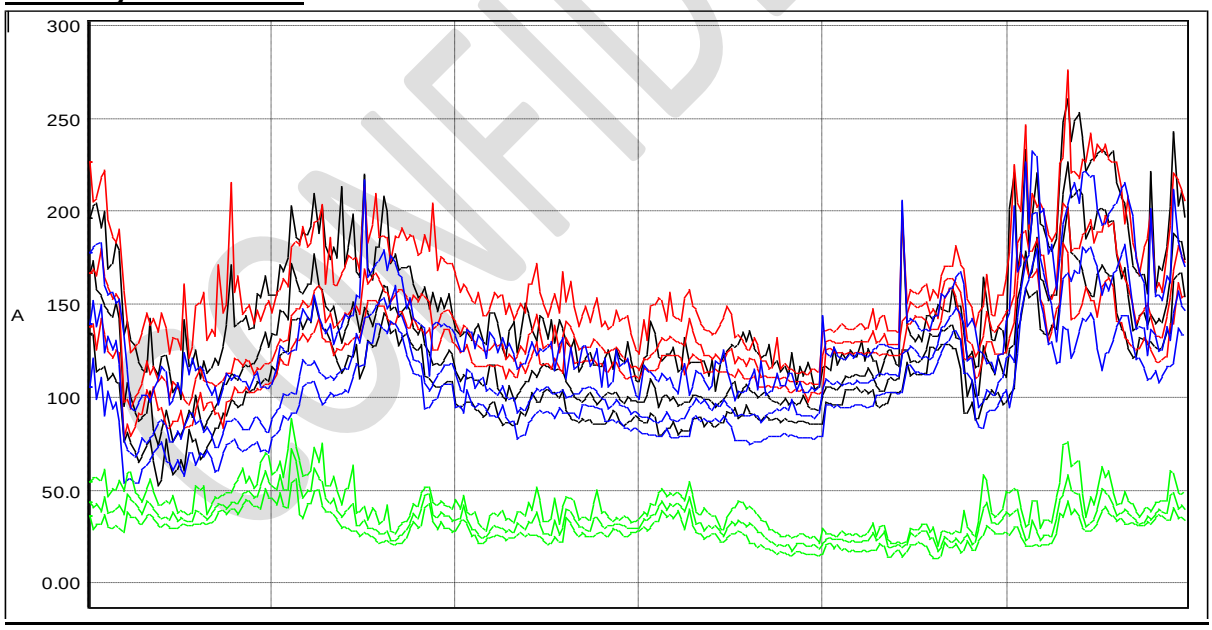
Parameter	Min (HZ)	Max (HZ)	Average (HZ)
Frequency	49.8	50.1	50

Trends of RMS Voltage



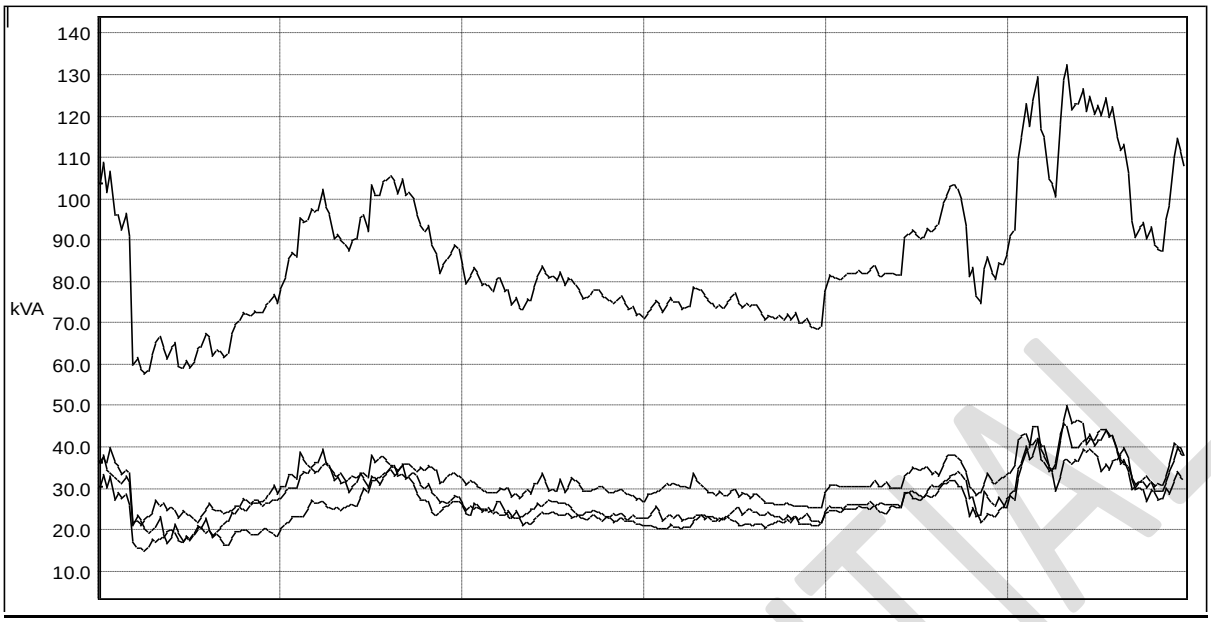
Parameter	Min (V)	Max (V)	Average (V)
Voltage (R-Phase)	350	414	398
Voltage (Y-Phase)	345	415	397
Voltage (B-Phase)	344	414	398

Trends of RMS Current



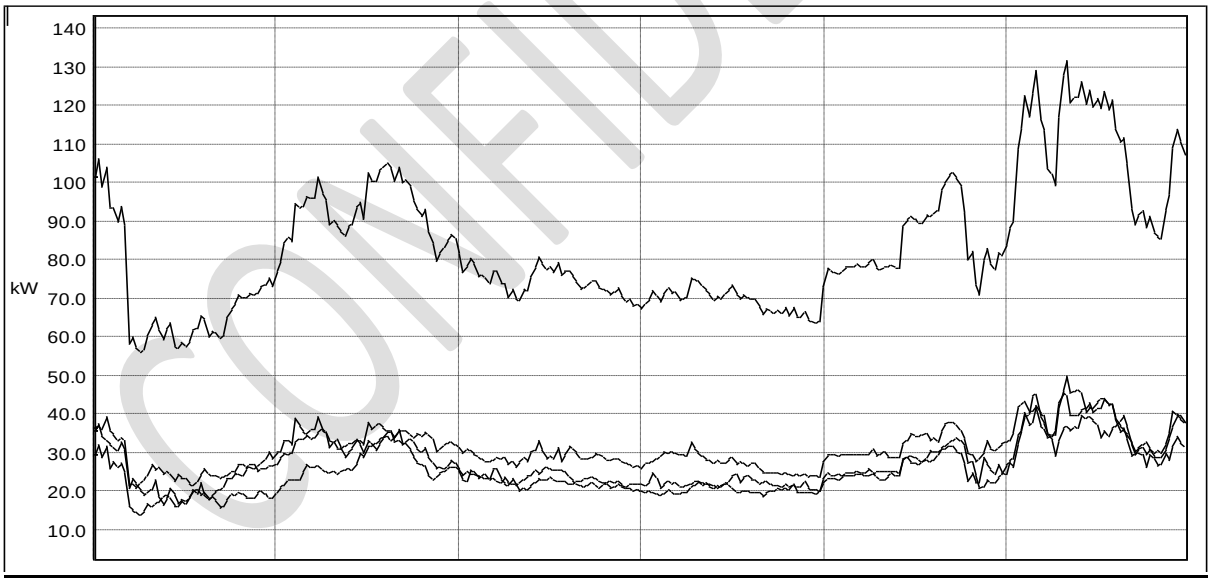
Parameter	Min (A)	Max (A)	Average (A)
Current (R-Phase)	52	271	128
Current (Y-Phase)	78	278	139
Current (B-Phase)	54	272	116
Current neutral	13	88	35

Trends of Apparent power



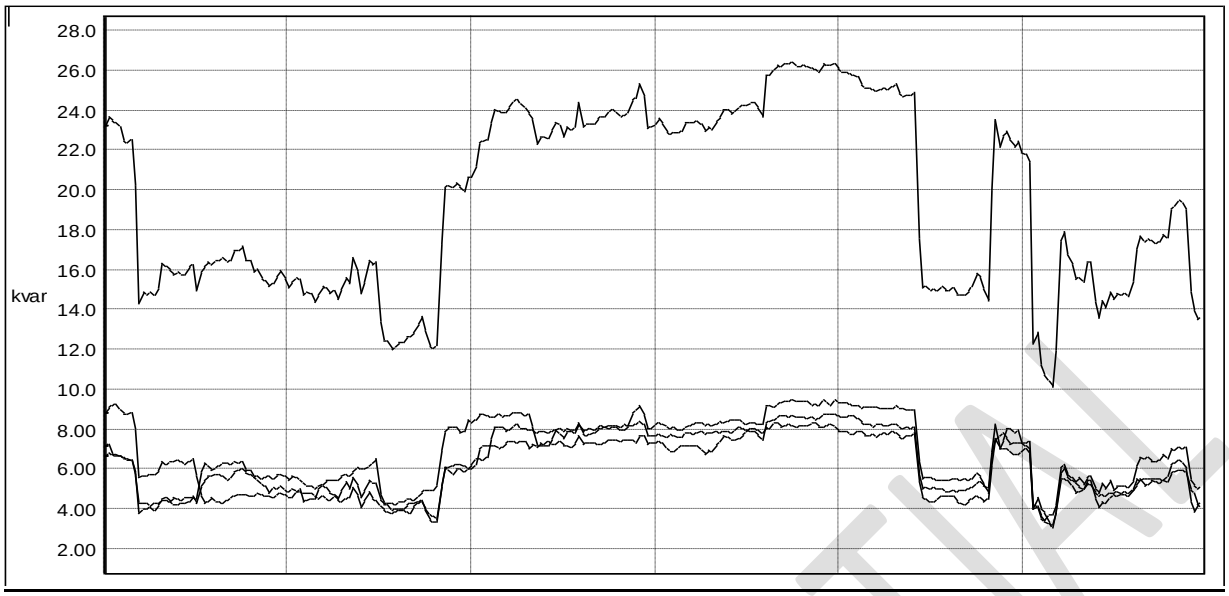
Parameter	Min (kVA)	Max (kVA)	Average (kVA)
Power (R-Phase)	16.2	50	28.5
Power (Y-Phase)	20.1	50	31.3
Power (B-Phase)	15	45	25.2
Power Total	57	132	85.5

Trends of Active power



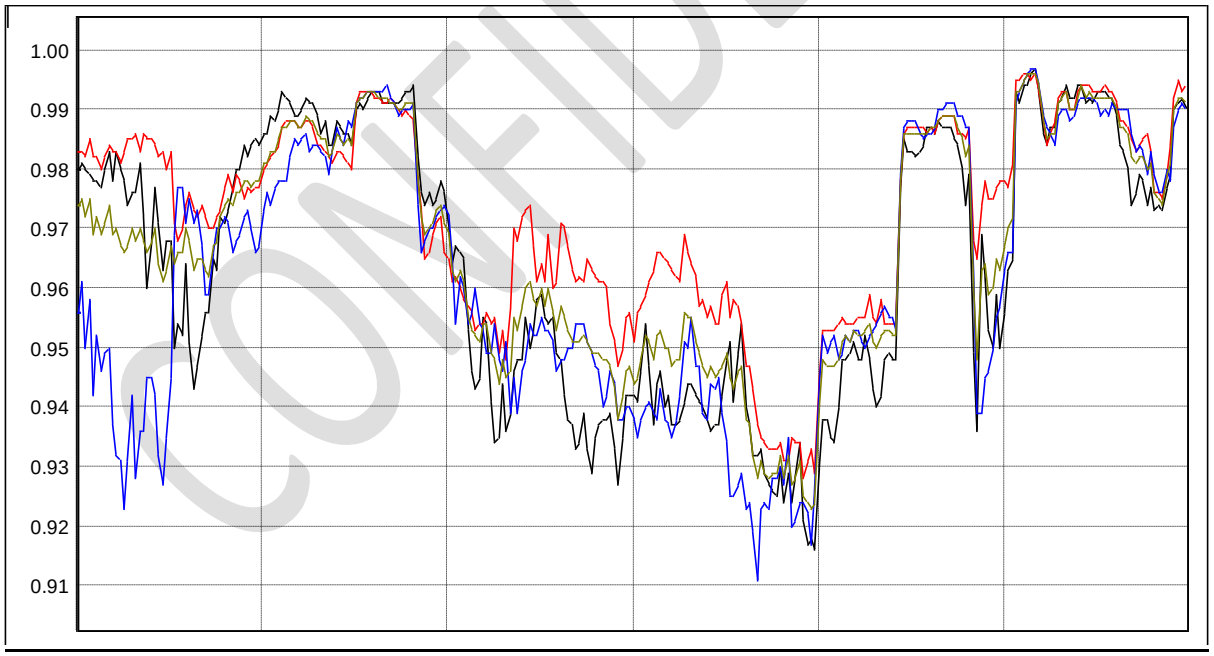
Parameter	Min (kW)	Max (kW)	Average (kW)
Active Power (R-Phase)	16.2	49.5	27.3
Active Power (Y-Phase)	20.3	45.5	30.4
Active Power (B-Phase)	13.3	45	24.6
Active Power Total	55	131	83.6

Trends of reactive power



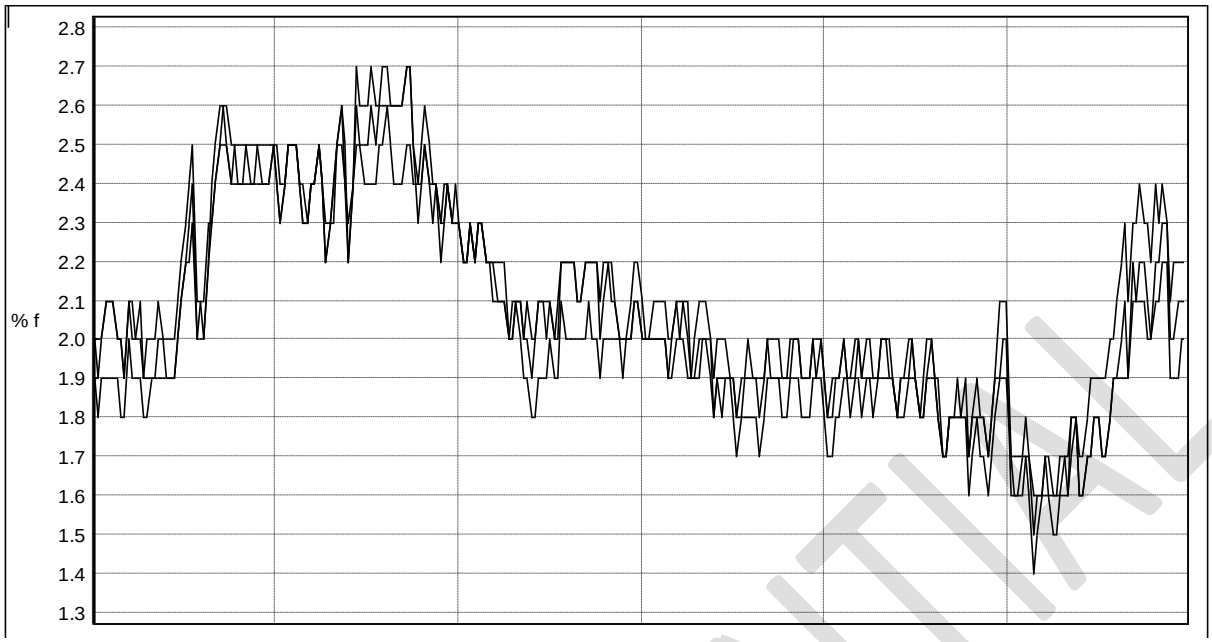
Parameter	Min (kVAr)	Max (kVAr)	Average (kVAr)
reactive Power (R-Phase)	3.4	8.7	6.7
reactive Power (Y-Phase)	3.2	9.4	6.5
reactive Power (B-Phase)	3.2	9.2	6.7
reactive Power Total	10	26.4	19.2

Trends of power Factor



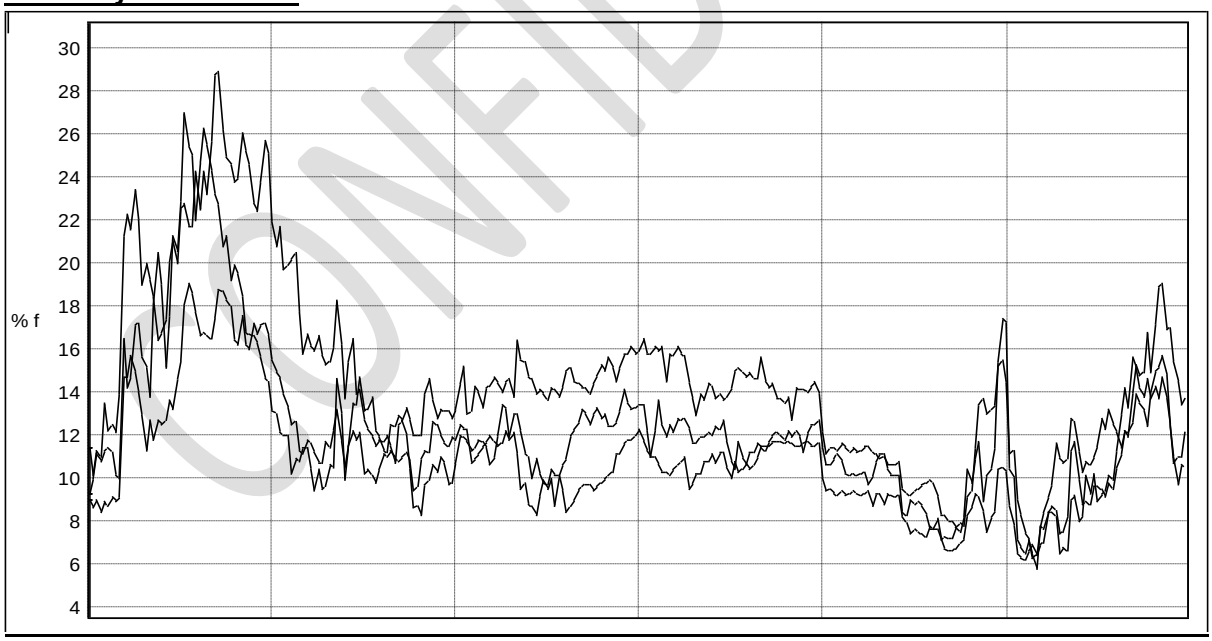
Parameter	Min	Max	Average
Power Factor (R-Phase)	0.916	0.996	0.976
Power Factor (Y-Phase)	0.921	0.997	0.965
Power Factor (B-Phase)	0.917	0.998	0.966
Power Factor Total	0.916	0.997	0.967

Trends of THD Voltage



Parameter	Min (%)	Max (%)	Average (%)
Vthd (R-Phase)	1.4	2.7	2.5
Vthd (Y-Phase)	1.3	2.8	2.5
Vthd (B-Phase)	1.4	2.7	2.7

Trends of THD Current



Parameter	Min (%)	Max (%)	Average (%)
Athd (R-Phase)	5	20	12
Athd (Y-Phase)	7	22	11
Athd (B-Phase)	6	25	14

Feeder wise load break-up

Sr No	LOCATION OF DB	VOLTAGE	CURRENT	POWER FACTOR	MEASUREDPOWER
1	Arjun Extension	380	2.9	0.86	1.6
2	Main faculty AC	382	NO LOAD		
3	Staff flat	390	34.8	0.85	20.0
4	Engineeering-1	387	34.4	0.84	19.4
5	Engineeering-2	379	24.4	0.85	13.6
6	Engineeering-4	381	11.5	0.82	6.2
7	I.M CPS building	380	3.8	0.79	2.0
8	Sawarkar hostel	379	21.4	0.85	11.9
9	Dhruv hostel	387	12	0.87	7.0
10	Arjun hostel	389	19.1	0.87	11.2
11	new gen	391	3.4	0.87	2.0
12	auditorium	394	4.7	0.87	2.8
13	pump(15HP)	379	22.7	0.86	12.8
14	Engineering-3	389	20.5	0.87	12.0

EFFECT OF UNBALANCE CURRENT

Unbalanced current refers to a situation in an electrical system where the currents flowing through the different phases (in a three-phase system) are not equal. This can have several effects on the electrical system, including

Voltage Imbalance: Unbalanced currents can lead to voltage imbalances. In a three-phase system, if the currents are not balanced, the voltages across the phases will also be unbalanced. This can result in uneven distribution of power and can lead to problems in connected equipment.

Overheating of Equipment: When currents are unbalanced, the load on each phase is different. The phase with the highest current will experience higher heating effects. This can lead to overheating of transformers, motors, and other equipment, potentially reducing their lifespan and efficiency.

Reduced Efficiency: Unbalanced currents can result in reduced system efficiency. The power factor of the system may be affected, leading to increased losses in the electrical components and reduced overall efficiency of the system.

Voltage Drop: Unbalanced currents can cause higher voltage drop in the system. This is because the impedance of the conductors and transformers may not be equally shared among the phases, resulting in higher losses and lower delivered voltage.

Reduced Motor Performance: Motors, particularly three-phase induction motors, are sensitive to unbalanced currents. They may experience higher mechanical stresses, reduced efficiency, and may even fail to start if the unbalance is severe.

Nuisance Tripping: Unbalanced currents can lead to the tripping of protective devices like circuit breakers or fuses. This is because protective devices are often designed to operate when they detect certain thresholds of current imbalance.

Poor Power Quality: Unbalanced currents can lead to poor power quality, which can affect the operation of sensitive electronic equipment. It can cause flickering lights, voltage sags, and other power quality issues.

Increased Energy Costs: Unbalanced currents can lead to higher energy consumption. This is because electrical distribution systems are typically designed to handle balanced loads efficiently. When loads are unbalanced, it can result in wasted energy.

Harmonic Distortion: Unbalanced currents can contribute to harmonic distortion in the system. This can lead to problems with sensitive electronic equipment and can also create additional losses in the system.

Safety Hazards: In extreme cases, unbalanced currents can lead to unsafe conditions, particularly in industrial settings. For example, in a factory, unbalanced currents can cause uneven torque in motors, potentially leading to machinery malfunctions or accidents.

To mitigate the effects of unbalanced currents, it's important to monitor the system regularly, balance loads where possible, and take corrective actions if significant imbalances are detected. This may involve redistributing loads, adjusting transformer taps, or installing additional equipment like static compensators or voltage regulators.

POWER QUALITY

Power quality is of prime importance in deciding the efficiency of any motor. Some of the critical parameters of the power quality are

- Harmonics
- Voltage Unbalance
- Voltage Fluctuations

In an alternating current (AC) system, the voltage potential and the current through load circuit is described in terms of frequency and amplitude. The frequency of the current will be identical to the frequency of the voltage as long as the load resistance/impedance does not change. In a linear load, like a resistor, capacitor or inductor, current and voltage will have the same frequency. As long as the characteristics of the load components do not change, the frequency component of the current will not change. When we deal with non-linear loads such as switching power supplies, transformers which saturate, capacitors which charge to the peak of

the supply voltage, and converters used in drives, the characteristics of the load are dynamic. As the amplitude of the voltage changes and the load impedance changes, the frequency of the current will change. That changing current and resulting complex waveform is a result of these load changes.

Harmonics are voltage and current frequencies riding on top of the normal sinusoidal voltage and current waveforms. Usually these harmonic frequencies are in multiples of the fundamental frequency, which is 50 hertz (Hz). Harmonics are created by these "switching loads" (also called "nonlinear loads," because current does not vary smoothly with voltage as it does with simple resistive and reactive loads). Each time the current is switched on and off, a current pulse is created. The resulting pulsed waveform is made up of a spectrum of harmonic frequencies, including the 50Hz fundamental and multiples of it. The higher-frequency waveforms collectively referred to as total harmonic distortion (THD), perform no useful work and can be a significant nuisance.

The operation of nonlinear loads causes the distorted current, which is path dependent; the effect of current distortion on loads within a facility is minimal. Therefore, harmonic currents can't flow into equipment other than the nonlinear loads that caused them. However, the effect of current distortion on distribution systems can be serious, primarily because of the increased current flowing in the system. Therefore, current harmonics causes increased losses in the customer and utility power system components.

Sources of harmonics

Following are some of the non-linear loads which generate harmonics:

- Static Power Converters and rectifiers, which are used in UPS, Battery chargers, etc.
- Arc Furnaces
- Power Electronics for motor controls (AC /DC Drives)
- Computers
- Television receivers
- Saturated Transformers
- Fluorescent Lighting
- Telecommunication equipment

Effects of harmonics

The harmonics have a multifold effect on various network elements present in a system. Whenever a harmonic current flows through an equipment,

• It causes additional losses due to its higher frequency, devices such as motors, transformers, etc. which has a laminated core have higher losses due to higher frequency of the harmonic current.

• In cables, the harmonic current trend to flow through the outer skin of the conductor due to skin effect and results in heating of these conductors.

• Harmonics can cause nuisance tripping of the relays and failure of capacitors installed in distribution system for power factor improvement

• Certain harmonic currents (for e.g. 5th harmonic) has the reverse phase sequence which means any electro mechanical device used for metering will not register true values. Similarly, in a polluted network a normal induction motor may not develop necessary torque because of harmonic current generating a torque in the reverse direction

• Higher order harmonics interfere with telecommunication system also. Whenever a telephone line runs parallel to a power line having harmonics, a noise is introduced in the telephone line. This phenomenon is known as telephonic interference

• A highly polluted voltage may lead to mal operation of devices such as thyristor, operation of which depend on the zero crossing of the voltage wave form. This may result in commutation failure in thyristor

• A high harmonic content also results in a low power factor. The angle between the fundamental component of current and voltage gives the Displacement Power Factor, whereas, the same between the voltage and RMS current (fundamental and harmonic) gives the total Power Factor. In a linear load, the P.F. and D.P.F. are same, whereas for the loads which generate lot of harmonics, the P.F. is much lower than the D.P.F.

• Some of the harmonic current which are zero sequence current (3rd harmonic current) tend to flow in the neutral in a 3 phase, 4 wire system. In most of the domestic and commercial load, which are non – linear in nature generate substantial amount of 3rd harmonic current, the neutral conductor gets overheated and may lead into melting of the same. It has been observed that in extreme cases, the neutral current can exceed 1.5 times the normal line current

• The harmonic current affects the generator also, as most of the big generators operate at maximum capacity and they do not have excessive margin to accommodate heating losses resulting due to flow of harmonic current into it. All such heating losses result in deterioration of insulation used in electrical equipment.

Mitigation of Harmonics

The best way to deal with harmonics problems is through prevention: choosing equipment and installation practices that minimize the level of harmonics in any one circuit or portion of a facility. Many power quality problems, including those resulting from harmonics, occur when new equipment is haphazardly added to older systems. However, even within existing facilities, the problems can often be solved with simple

solutions such as fixing poor or non-existent grounding on individual equipment or the facility as a whole, moving a few loads between branch circuits, or adding additional circuits to help isolate the sensitive equipment from what is causing the harmonic distortion. If the problems cannot be solved by these simple measures, there are two basic choices: to reinforce the distribution system to withstand the harmonics or to install devices to attenuate or remove the harmonics2 . Reinforcing the distribution system can be done by installing double-size neutral wires or installing separate neutral wires for each phase, and/or installing oversized or K-rated transformers, which allow for more heat dissipation. There are also harmonic-rated circuit breakers and panels, which are designed to prevent overheating due to harmonics. This option is generally more suited to new facilities, because the costs of retrofitting an existing facility in this way could be significant. Strategies for attenuating harmonics, from cheap to more expensive, include passive harmonic filters, isolation transformers and active filters.

Functions of Harmonic Filter

1. Reduces neutral current
2. Reduces transformer loading
3. Protects electrical systems
4. Reduces fire hazard
5. Protects the neutral conductor
6. Enhance system protection
7. Minimizes impact on distribution transformers
8. Reduces local neutral local to ground voltage
9. Increases system capacity
10. Decreases system losses
11. Reduces Total Harmonic Distortion (THD)

Passive filters include devices that provide low-impedance paths to divert harmonics to ground and devices that create a higher-impedance path to discourage the flow of harmonics. Both of these devices, by necessity, change the impedance characteristics of the circuits into which they are inserted. Another weakness of passive harmonic technologies is that, as their name implies, they cannot adapt to changes in the electrical systems in which they operate. This means that changes to the electrical system (for example, the addition or removal of power factor–correction capacitors or the addition of more nonlinear loads) could cause them to be overloaded or to create "resonances" that could actually amplify, rather than diminish, harmonics.

Isolation transformers are filtering devices that segregate harmonics in the circuit in which they are created, protecting upstream equipment from the effects of harmonics. These transformers do not remove the problem in the circuit generating the

harmonics, but they can prevent the harmonics from affecting more sensitive equipment elsewhere within the facility.

Active harmonic filters, in contrast, continuously adjust their behaviour in response to the harmonic current content of the monitored circuit, and they will not cause resonance. Active filters are designed to accommodate a full range of expected operating conditions upon installation, without requiring further adjustments by the operator.

Selection of Harmonic Filter

The selection of harmonic filter must be based on the following criteria

1. kVA requirements of the load
2. Harmonic profile of the load current
3. Harmonic factor of the neutral current
4. Configuration of existing or proposed system

Calculation of Distortions

Current Distortion

Total current distortion, in general defines the relationship between the total harmonic current & fundamental current.

Total Harmonic Distortion, THD(I) = IH/IL
Where, IH = (I2 2 + I3 2 + …+ I2 25) 1/2 x 100
IL = The maximum Load current (Fundamental frequency component)
The upper summation limit of H = 25 is chosen for practical purpose.

Voltage Distortion

Total voltage distortion in general defines the relationship between the total harmonic voltage and fundamental voltage.

Total Harmonic Distortion THD(V) = VH/VL

Where,

VH = (V2 2 + V3 2 + …+ V2 25) 1/2 x 100
(Total line to neutral harmonic voltage)
VL = Fundamental AC line to neutral voltage
Voltage distortion is created by current distortion or inherent due to the type of voltage source

IEEE Standards IEEE Standard 519 (1992) has been already existing which specifies limits of the harmonics in power systems. The acceptable limit for harmonic distortion as per IEEE standard is as under:

Voltage Harmonics

Supply System Voltage (kV) at point of common coupling	Total Harmonic Voltage Distortion V_T (%)	Individual HarmonicVoltage Distortion (%)	
		Odd	Even
0.415	5	4	2
6.6 and 11	4	3	1.75
33 and 66	3	2	1
132	1.5	1	0.5

Supply System Voltage (kV) at point of common coupling Total Harmonic Voltage Distortion VT (%) Individual Harmonic Voltage Distortion (%) Odd Even

Maximum Harmonic Current in % of I_L

I_{SC}/I_L	<11	11 < h <17	17 < h <23	23 < h <35	THD
<20	4.0	2.0	1.5	0.6	5.0
20 < 50	7.0	3.5	2.5	1.0	8.0
50 < 100	10.0	4.0	4.0	1.5	12.0
100 < 1000	12.0	5.5	5.0	2.0	15.0
> 1000	15.0	7.0	6.0	2.5	20.0

Even harmonics are limited to 25% of the odd current harmonic limits above

Where,

I SC = Maximum short circuit current at PCC

I L = Maximum demand load current at PCC

(Fundamental frequency component)

The allowable % current harmonics is based on the Isc/IL ratio at that customer's point of common coupling with the utility. The following example shows how to arrive at the Isc / IL of the transformer.

Consider a transformer of 2000kVA with rated full load current of 2666A. The transformer impedance is 6.42%.

Short Circuit Current Isc = I L /Zi

= 2666/.0642

= 41,526A Therefore

Isc/IL = 41256/2666

I sc/IL = 15.47

Apart from G5/3, IEEE 519 (1992), other guidelines such as IEC 1000 - 2 -2 define acceptable limits of harmonics in power system. In India, till now no guideline has been published. However, the Central Board of Irrigation & Power (CBIP) is working in this direction and has published a finding on presence of harmonics at various voltage levels for industrial load as well as for utility supply system.

Solar Power availablity on the Roof Top

During energy audit we have analysed that there are solar panel installed of 50Kw and other one is 70Kw. Month wise unit generation are given below in tabular form.

Monthly unit generated.

Sr No	Months	50kW	70kW
1	Dec-22	1457	5803
2	Jan-23	3874	7304
3	Feb-23	3917	7057
4	Mar-23	5078	7974
5	Apr-23	5796	9005
6	May-23	5488	8270
7	Jun-23	4817	8153
8	Jul-23	3233	6400
9	Aug-23	4534	7153
10	Sep-23	4571	7461
11	Oct-23	4744	7536
12	Nov-23	2231	4885
Total		**49740**	**87001**

DG SET PERFORMANCE ANALYSIS

The ITS Engineering college has installed 2 Nos. of DG sets i.e.

1. 500 KVA – 1nos
2. 82.5 KVA – 1 nos

Out of these, they normally operate 1 set i.e. 500 KVA and other one operated only for Emergency. During energy audit, performance analysis done with previous logged data with respect to specific fuel consumption (units/Liter) The details parameter is as follows:

D.G.SET-500 KVA and 82.5 KVA

Sr. No	Months	Fuel Consumption (Lit)	Running Hrs	Unit Generated(kwh)	SEC (Kwh/Litre)
1	Dec-22	100	3.12	188.24	1.88
2	Jan-23	80	2.5	198.33	2.48
3	Feb-23	115	4	287.08	2.50
4	Mar-23	510	21	1261	2.47
5	Apr-23	330	8.42	914	2.77
6	May-23	267.5	5.18	727.2	2.72
7	Jun-23	200	4.36	553.29	2.77
8	Jul-23	750	18.36	2201.09	2.93
9	Aug-23	220	3.42	583.91	2.65
10	Sep-23	600	14.24	1964.79	3.27
11	Oct-23	288	5.18	85	0.30
12	Nov-23	28	0.42	38.48	1.37
AVG		**290.7**		**750.2**	**2.58**

D.G.SET-82.5 KVA

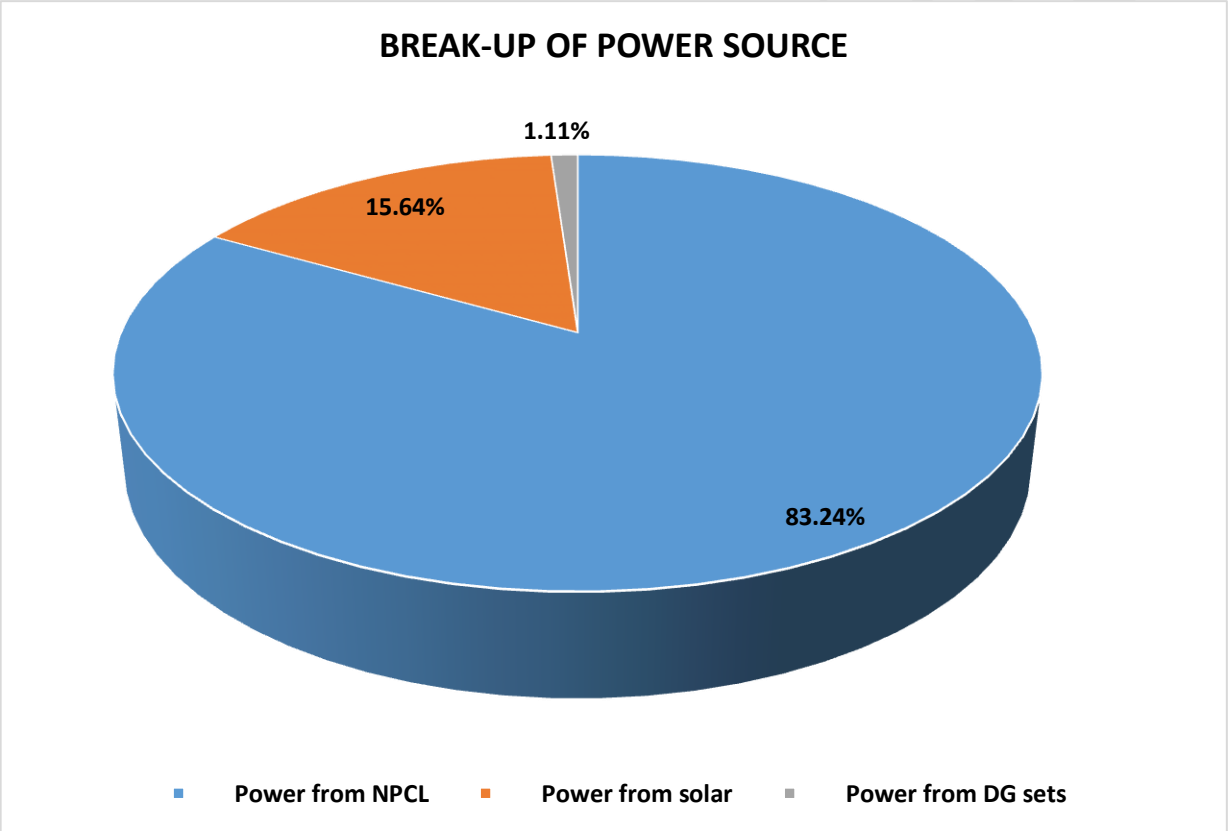
Sr. No	Months	Fuel Consumption (Lit)	Running Hrs	Unit Generated(kwh)	SEC (Kwh/Litre)
	Dec-22	225.37	12.37	613.9	2.72
	Jan-23	30	1.47	104.8	3.49

Observation & comments

During audit, we have analyzed the previous data of fuel consumption, unit generation and running hours, from these data we have analyzed specific energy consumption. The details analysis is given in Above table.

TOTAL UNIT CONSUMPTION OF ITS COLLEGE

Power from NPCL	:	7,27,623 units
Power from solar	;	1,36,741 units
Power from DG sets	:	9,721
Total annual power	**:**	**8,74,085**



ILLUMINATION PERFORMANCE ANALYSIS

Though energy-efficient technologies can cut down energy consumption and operating costs, the light path originating from the light source if not properly directed and distributed to the task or activity area through appropriate lamp luminaries (fixtures), could adversely affect the quality of light and reduce energy efficiency gains. Consequently, luminaries' selection and design should go together with any energy-efficient lighting strategy.

Since LEDs are most energy-efficient luminaries in the market available therefore our recommendations are mainly concentrated on it. We are glad to see that the management of M/S ITC Engineering college, Greater Noida has installed LED lights most of the places but still conventional lights are being used at few places. A brief description of LED is given below: -

During the past few years, solid-state lighting in general and Light Emitting Diodes (LEDs) in particular have received more attention than any other lighting technology. This high level of interest is based on the demonstrated performance advantages of LEDs in many niche applications, and it is also fueled by LEDs' potential for substantial energy savings in general lighting applications if the technology can meet the performance targets established by its proponents. LEDs use solid-state electronics to create light. Major elements in the packaging of an LED include a heat sink to dissipate the energy that is not converted into light, a lens to direct the light output, and leads to connect the LED to a circuit. LEDs are increasing in efficacy, light output, and color availability while dropping in cost. High brightness, narrowband, or various-color LEDs are being used increasingly in vehicle signal lights, traffic signal lights, exit signs, and decorative and information display applications. Composite units of red, green, and blue LEDs, or of systems composed of a blue or violet LED plus a phosphor coating, are being used to create white light further expanding LED applications.

During audit, Lux level was measured at most all the places where ever it is possible and permitted are as follows;

LUX LEVEL MEASUREMENT

Sr No	Building Name	Floor	Old light inventory		LUX LEVEL
1	Engineering Building	Basement	87	66	130
		Ground	62	18	240
		First	93		200
		second	107		180
		Third	148		230
		Fourth	3		240
		Auditorium			200
2	CPS Building	Ground	14	16	220
		First	32	37	198
		Second	25		202
		Third	29		203
3	Dhruva Hostel	Bathroom	1		200
		Room 15	3		195
		First floor corridor	1		202
		Room (17)	2		230
		Mess	5		250
		Third floor room (24)	13		218
4	Arjun Hostel	Ground floor Bathroom	1		220
		Corridor	1		230
		Room No (14)	2		240
		Third floor Bathroom	2		250
		Corridor	2		240
		Room no (10)	7		261
		Fourth floor Bathroom	1		250
		Corridor	0		252
		Room no-10	2		251
		mess hall	1		243
		Common hall	11		250
TOTAL			**655**	**137**	

Analysis & comments

The Above table shows the Lux level at different locations of the ITS Engineering building with light fixture of old and LED. It is noted that still old type tube light and CFL illuminate there which consume more energy than new type LED fixture and LED panel light. So the it is suggested to replace all the old type tube light and CFL fixture with energy efficient LED tube light and LED panel light the expected energy saving in lighting is given as follows:

ECM: -Energy saving by Replacement of 36W old tube light with 20W Led Fixture.

A. Title Recommendation	:	Replace all the 36W tube with 20W LED Fixture
B. Description of Existing system	:	At present they are using 36W tube with copper choke
C. Recommendation	:	It should be replaced with 20W LED
D. Energy Saving Calculation		
Average power consumption of 36W tube With Metallic Blast	:	40 W
Average power consumption of 20W LED tube	:	20 W
Average power saving after replacement	:	20 W
Average working hour per day	:	10 hrs.
Average No. of working days	:	230 days
Approximate No. of tube	:	655
E. Cost Benefit Calculation		
Annual Energy Saving potential	:	30,130.00 units
Power tariff	:	Rs. 8.32 per unit
Annual Cost Saving	:	Rs. 250681.60
Cost of per LED	:	Rs. 250 per fixture
Total investment cost	:	Rs. 163750
Simple Payback Period	:	0.65 years

ECM: -Energy saving by Replacement of 36W*2 CFL light with 32W Led Panel.

A. Title Recommendation	:	Replace all the 36W*2 CFL with 32W LED Panel	
B. Description of Existing system	:	At present they are using 72W CFL Panel	
C. Recommendation	:	It should be replaced with 32W LED Panel	
D. Energy Saving Calculation			
Average power consumption of 72W CFL	:	80	W
Average power consumption of 322W LED Panel	:	32	W
Average power saving after replacement	:	48	W
Average working hour per day	:	10	hrs.
Average No. of working days	:	230	days
Approximate No. of CFL	:	137	
E. Cost Benefit Calculation			
Annual Energy Saving potential	:	15124.80	units
Power tariff	:	Rs. 8.32	per unit
Annual Cost Saving	:	Rs. 1,25,838	
Cost of per LED	:	Rs. 1500	per fixture
Total investment cost	:	Rs. 205500	
Simple Payback Period	:	1.63	years

1. THERMOGRAPHY

This Report of Infrared Inspection provides complete documentation of thermal patterns detected in your electrical & mechanical installations scanned during the Thermographic inspection. It primarily uses a subjective evaluation. It helps you to prioritize repairs and to provide the greatest return to maintenance cost.

1.1 Working Principle:

Infrared Camera sees the heat radiated from object surface in real time, just like a video camera sees visible light. Hot and cold markers automatically identify hottest and coldest spots within field of view by Pointer/ indicator.

1.2 Severity Ratings:

Each thermograph is given a Subjective Fault Category Rating, which is determined on risk of failure, based upon our opinion, of how critical the subject item is to the energy

Fault Category	Temperature Rise Above Ambient	Recommendations
Normal	$1^{O}C$ to $10^{O}C$	Ok
Beginning of Problem	$>10^{O}C$ to $20^{O}C$	Need Routine Monitoring
First Stage of Overheating	$>20^{O}C$ to $40^{O}C$	Need Attention
Excessive Overheating	$>40^{O}C$	Need Immediate Action

Table 1: Fault Category Rating Logic

2. EXECUTIVE SUMMARY

We have scanned the Electrical Installations of your facility with an Infrared Camera which is one of the best images available in the world for electrical & industrial applications.

During the scanning process, in all 40 anomalies were identified and ambient temperature is taken 15-18^{O}C. As per the severity priority rating considered in the report, categorization of the anomalies and their repair priorities are as under

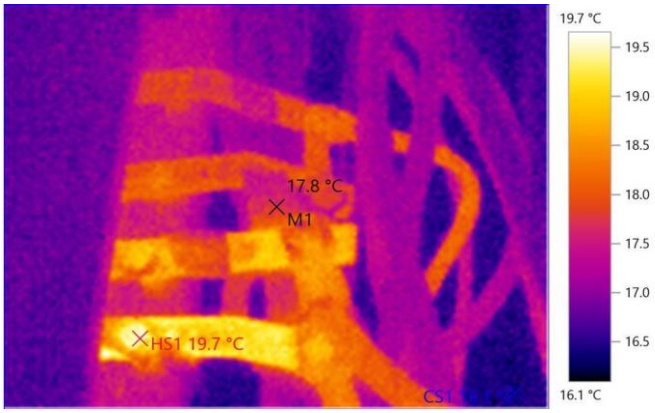
2.1 Anomaly Summary:

Sr. No.	IMAGE NO	Location	Measured Temperature	Ambient Temperature	REMARKS
ITS Engineering College					
1	IR002049	Engineering-1	19.7	15	Ok
2	IR002050	Main incomer	27.9	15	Need Routine Monitoring
3	IR002051	Engineering-1 db.	20.2	15	ok
4	IR002052	Engineering-2 db.	19.9	15	ok
5	IR002055	Engineering -4 db	18.9	15	ok
6	IR002056	Dhruv hostel main db	20.2	15	ok
7	IR002057	Arjun hostel db	17.4	15	ok
8	IR002058	Newgen arjun extension	16.5	15	ok
9	IR002059	Auditorium	17.5	15	ok
10	IR002060	Angineering-3	19.7	15	ok
11	IR002062	Basement	18.2	15	ok
12	IR002063	Main gate	17.9	15	ok
13	IR002064	Mandir DB	19.4	15	ok
14	IR002065	Engineering-4 MDB	18.8	15	ok
15	IR002066	Mechanical lab main incomer	16.6	15	ok
16	IR002067	Electrical lab main incomer	17.3	15	ok
17	IR002068	Engineering-2 Main Switch R-	28.5	15	Need Routine Monitoring

		Phase			
18	IR002069	Busbar	19.5	15	ok
19	IR002070	Floor DB	96.3	15	Need Immediate Action
20	IR002071	Engineering-3 MDB	31.3	15	Need Routine Monitoring
21	IR002072	Ramp Busbar	25.8	15	ok
22	IR002073	Auditorium Main Switch	22.1	15	ok
23	IR002074		23.4	15	ok
24	IR002075	CPS Building MDB	19.4	15	ok
25	IR002076	Lift DB	17.7	15	ok
26	IR002077	CPS First Floor DB	19.4	15	ok
27	IR002078	2nd Floor DB	18.9	15	ok
28	IR002079	Newgen Building MDB	26.2	15	Need Routine Monitoring
29	IR002080	Arjun Hostel MDB	18.1	15	ok
30	IR002081	Lift DB	17.5	15	ok
31	IR002082	Floor -1	20.2	15	ok
32	IR002083	Floor -2	23.1	15	ok
33	IR002084	Boys Hostel Floor MCB	47.7	15	Need Attention
34	IR002085		37.9	15	Need Routine Monitoring
35	IR002086	Savarkar Hostel MDB	32.5	15	Need Routine Monitoring
36	IR002087		77.8	15	Need Immediate Action
37	IR002088		24	15	ok
38	IR002089	Staff Block A	36	15	Need Routine Monitoring
39	IR002090	Staff Block B	23.2	15	ok
40	IR002091	Staff Block C	21	15	ok

Note: - Thermography images are given below.

File:	engineering-1 mdb.BMT	**Date:**	28-12-2023
lens type:	31° x 23° **lens serial no.:**	**Time:**	14:13:57



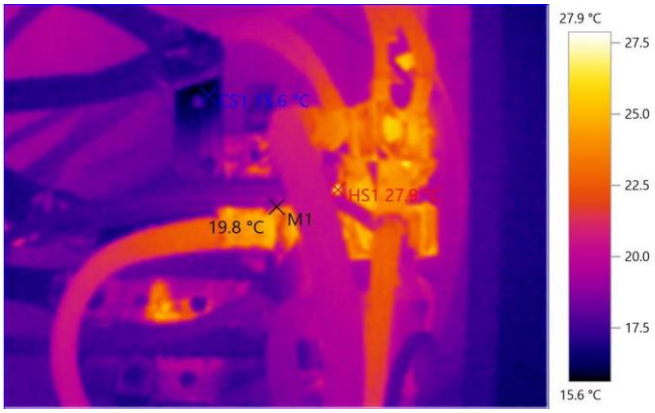
Picture parameters:

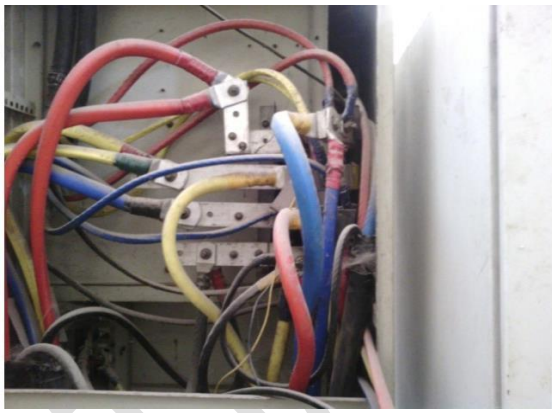
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.8	0.95	20.0	CenterSpot
Cold spot 1	16.1	0.95	20.0	-
Hot spot 1	19.7	0.95	20.0	-

File:	IR002050 main incomer.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:15:45





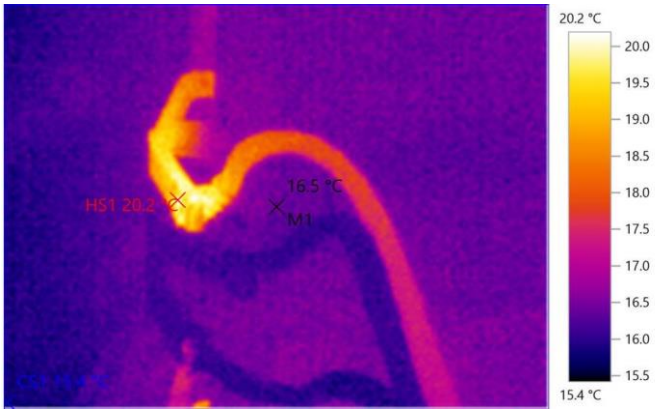
Picture parameters:

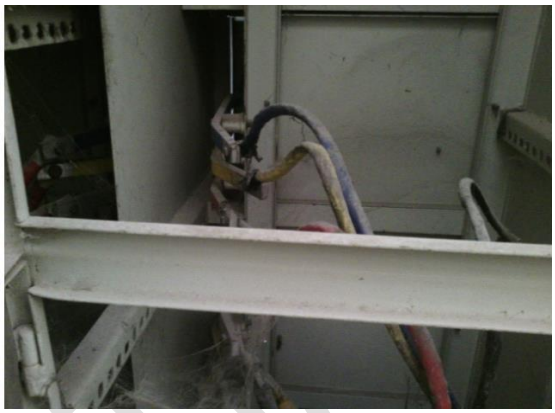
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	19.8	0.95	20.0	CenterSpot
Cold spot 1	15.6	0.95	20.0	-
Hot spot 1	27.9	0.95	20.0	-

File:	IR002051 engineering-1 db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:21:44





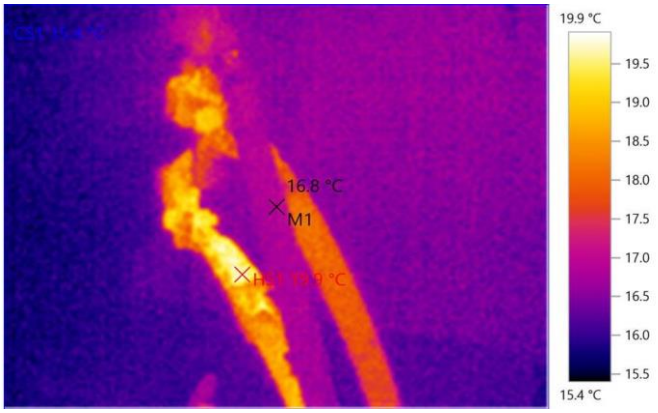
Picture parameters:

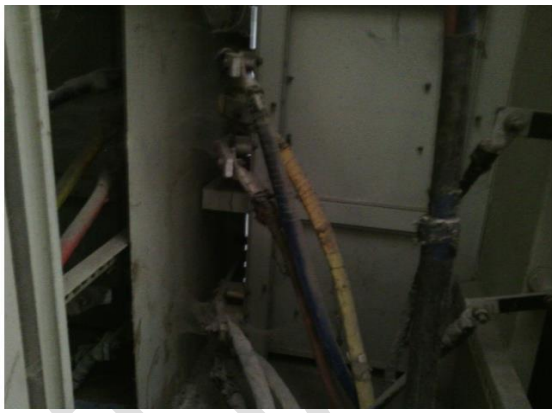
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.5	0.95	20.0	CenterSpot
Cold spot 1	15.4	0.95	20.0	-
Hot spot 1	20.2	0.95	20.0	-

File:	IR002052 engineering -2 db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:21:57





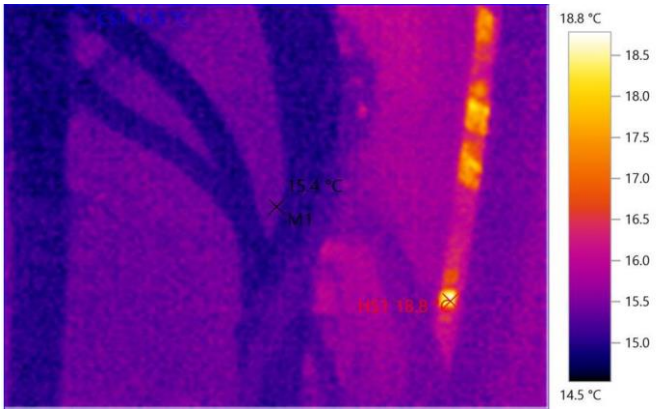
Picture parameters:

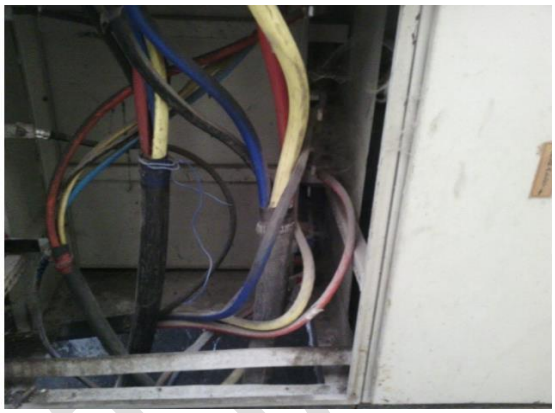
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.8	0.95	20.0	CenterSpot
Cold spot 1	15.4	0.95	20.0	-
Hot spot 1	19.9	0.95	20.0	-

File:	IR002055 engineering -4 db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:30:42





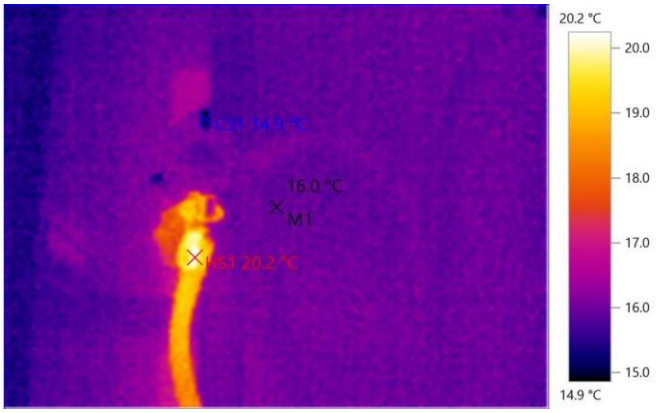
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	15.4	0.95	20.0	CenterSpot
Cold spot 1	14.5	0.95	20.0	-
Hot spot 1	18.8	0.95	20.0	-

File:	IR002056 dhruv hostel main db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:31:28



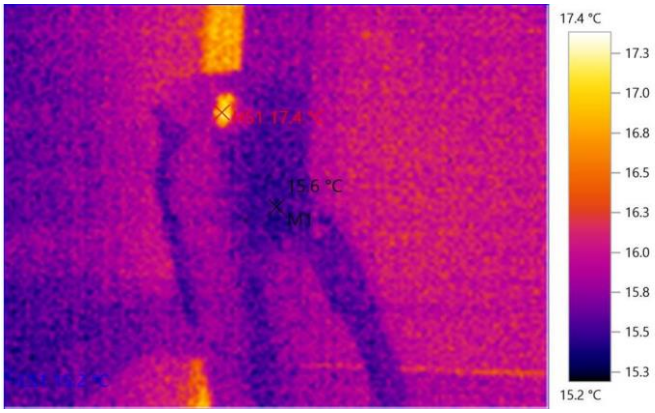
Picture parameters:

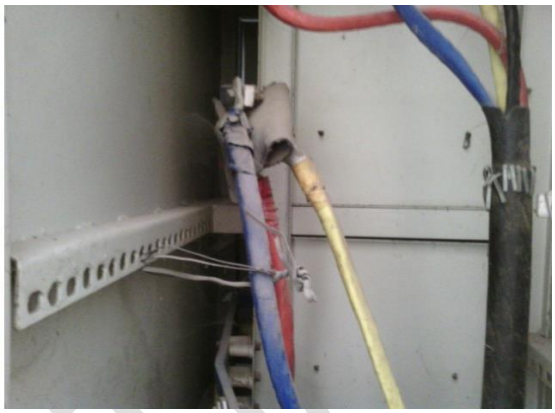
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.0	0.95	20.0	CenterSpot
Cold spot 1	14.9	0.95	20.0	-
Hot spot 1	20.2	0.95	20.0	-

File:	IR002057 arjun hostel db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:32:10





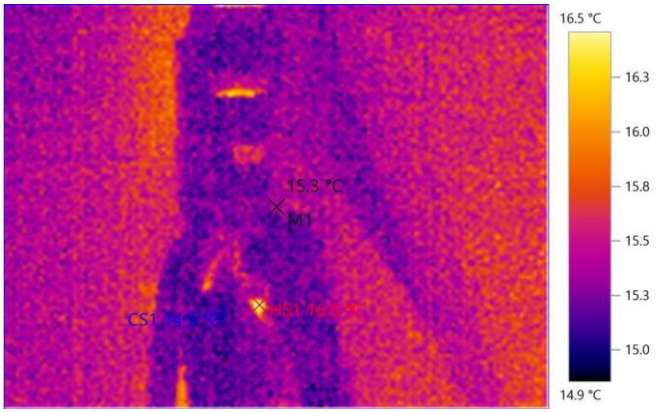
Picture parameters:

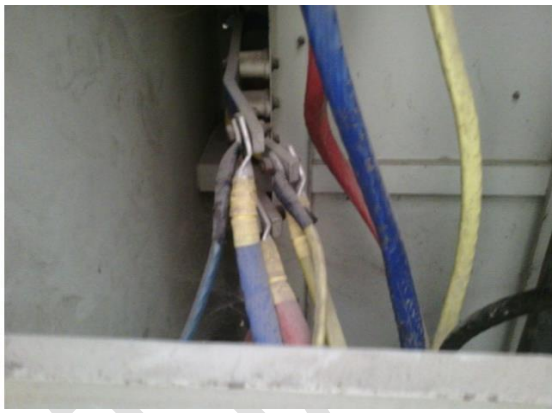
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	15.6	0.95	20.0	CenterSpot
Cold spot 1	15.2	0.95	20.0	-
Hot spot 1	17.4	0.95	20.0	-

File:	IR002058 newgenarjunextension.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	12:32:19





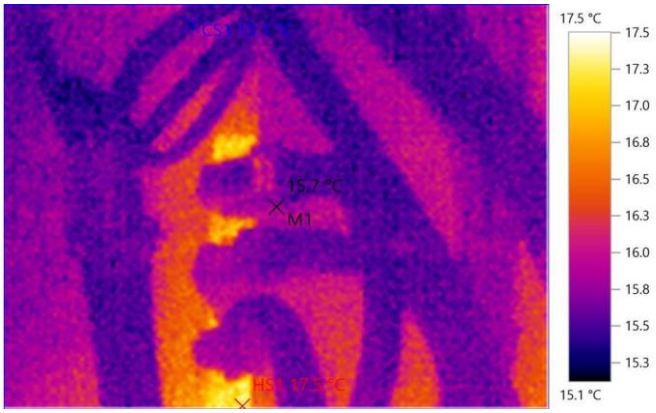
Picture parameters:

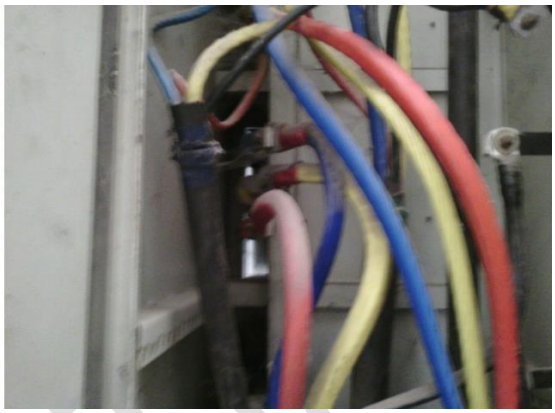
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	15.3	0.95	20.0	CenterSpot
Cold spot 1	14.9	0.95	20.0	-
Hot spot 1	16.5	0.95	20.0	-

File:	IR002059 auditorium.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:32:30





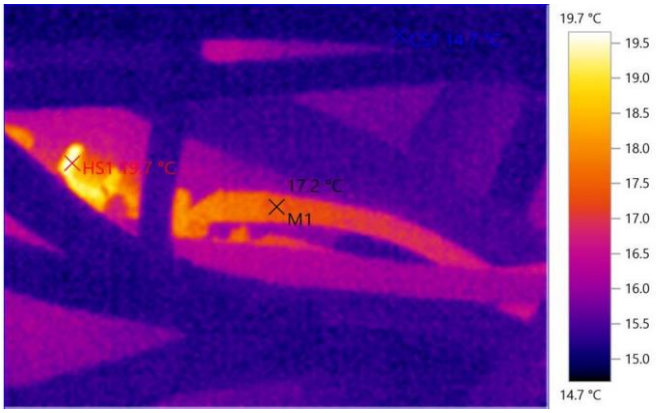
Picture parameters:

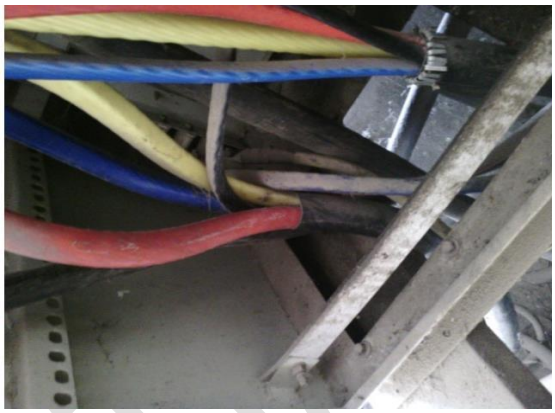
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	15.7	0.95	20.0	CenterSpot
Cold spot 1	15.1	0.95	20.0	-
Hot spot 1	17.5	0.95	20.0	-

File:	IR002060 engineerng-3.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	12:32:49





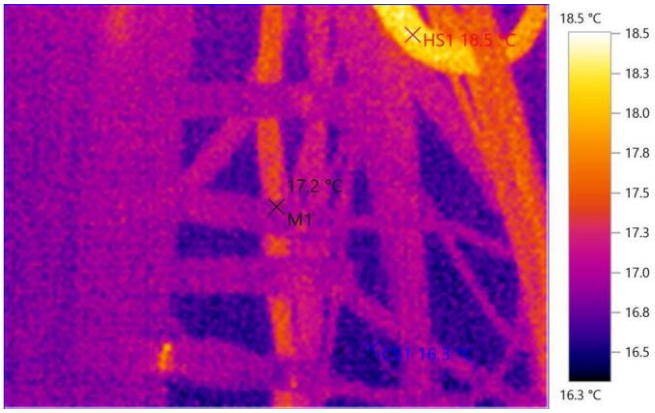
Picture parameters:

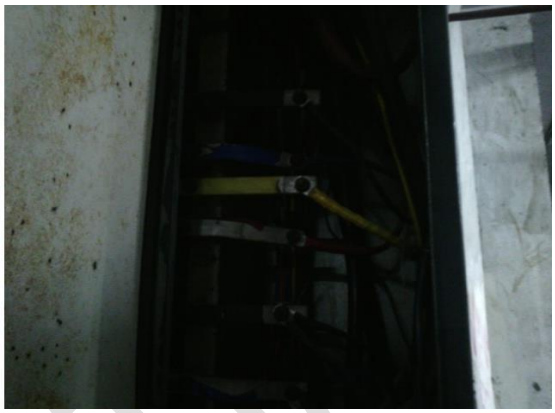
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.2	0.95	20.0	CenterSpot
Cold spot 1	14.7	0.95	20.0	-
Hot spot 1	19.7	0.95	20.0	-

File:	IR002062 basement.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:14:11





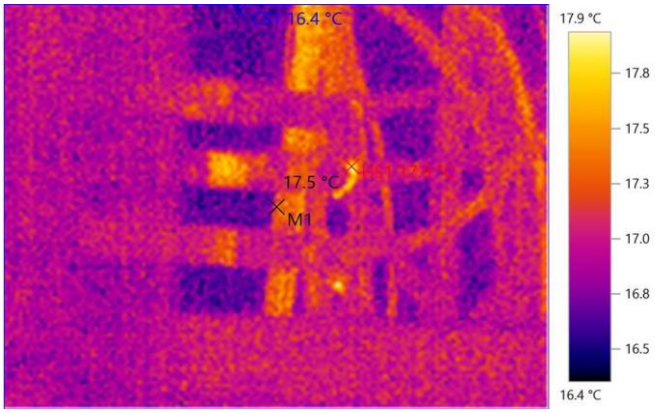
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.2	0.95	20.0	CenterSpot
Cold spot 1	16.3	0.95	20.0	-
Hot spot 1	18.5	0.95	20.0	-

File:	IR002063 main gate.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:14:18



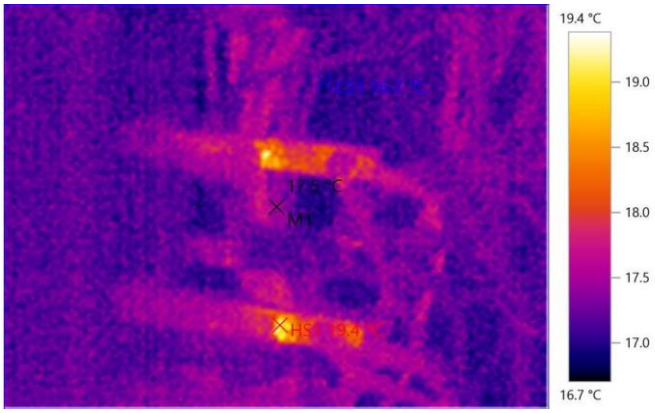
Picture parameters:

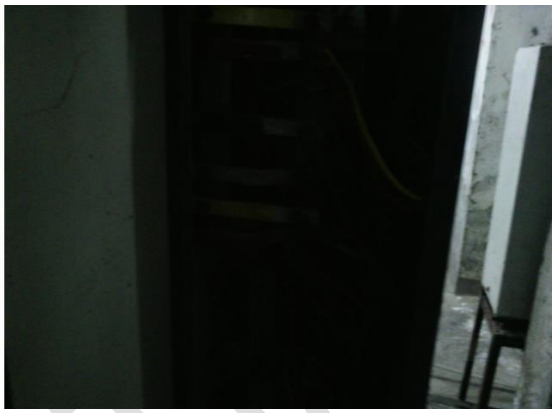
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.5	0.95	20.0	CenterSpot
Cold spot 1	16.4	0.95	20.0	-
Hot spot 1	17.9	0.95	20.0	-

File:	IR002064 mandir db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:14:30





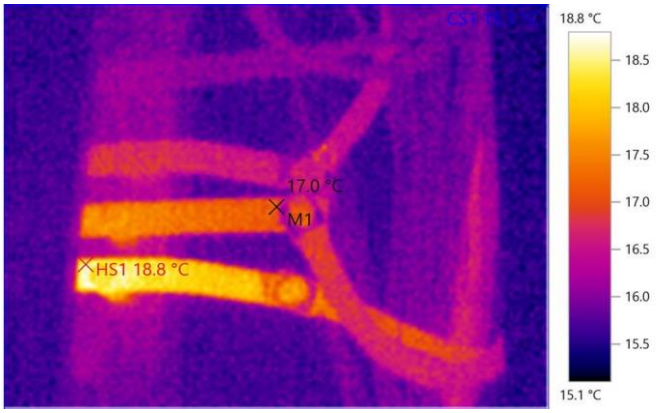
Picture parameters:

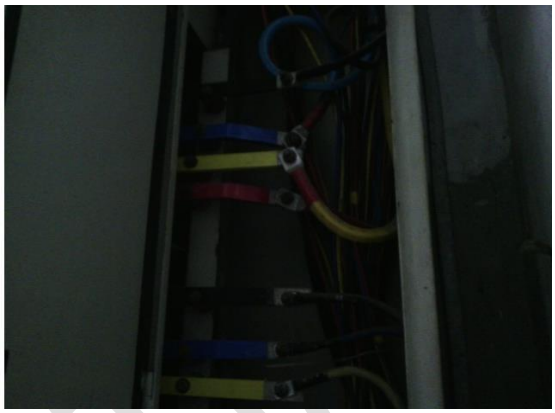
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.5	0.95	20.0	CenterSpot
Cold spot 1	16.7	0.95	20.0	-
Hot spot 1	19.4	0.95	20.0	-

File:	IR002065 engineering -4 mdb.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:18:57





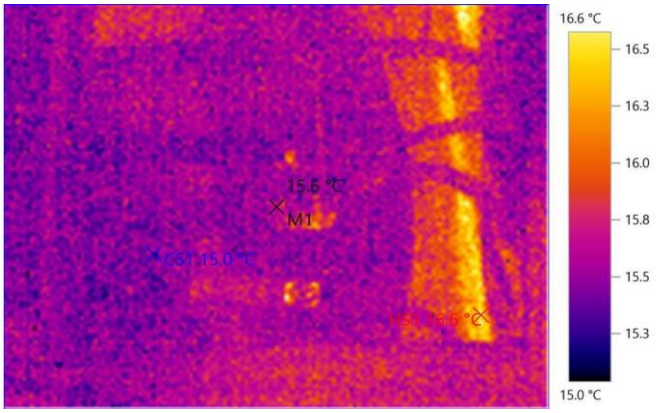
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.0	0.95	20.0	CenterSpot
Cold spot 1	15.1	0.95	20.0	-
Hot spot 1	18.8	0.95	20.0	-

File:	IR002066 mechanical lab main incomer.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:19:07



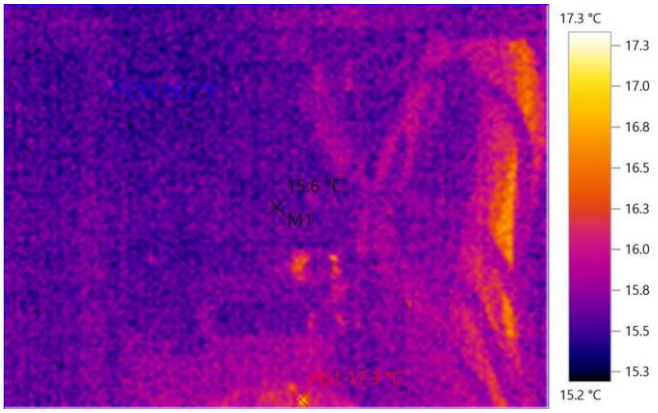
Picture parameters:

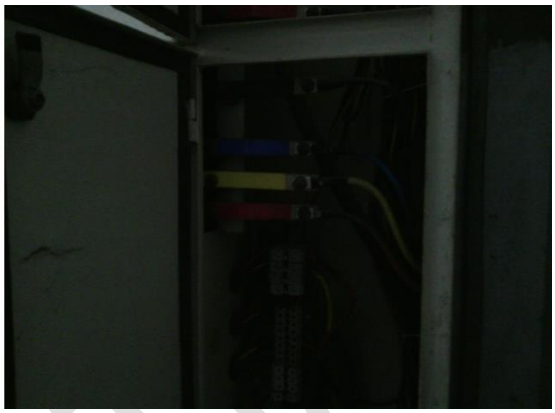
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	15.6	0.95	20.0	CenterSpot
Cold spot 1	15.0	0.95	20.0	-
Hot spot 1	16.6	0.95	20.0	-

File:	IR002067 electrical lab main incomer.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	**Time:**	14:19:18





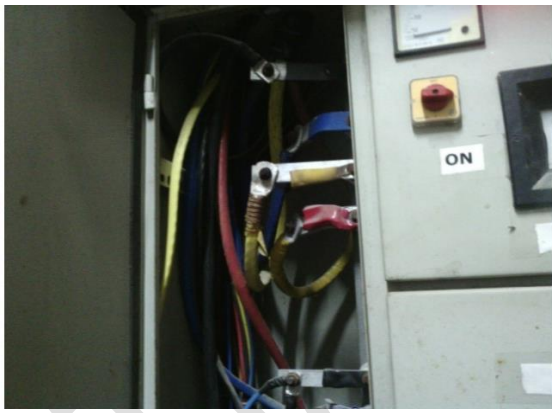
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	15.6	0.95	20.0	CenterSpot
Cold spot 1	15.2	0.95	20.0	-
Hot spot 1	17.3	0.95	20.0	-

File:	IR002068 engineering -2 main switch.BMT	**Date:**	28-12-2023
lens type:	31° x 23° **lens serial no.:**	**Time:**	14:25:08



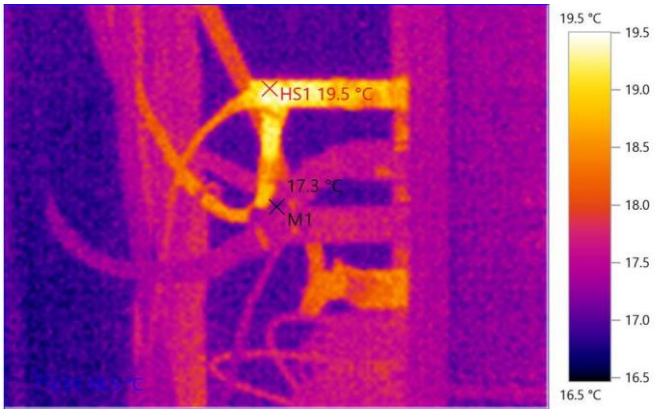
Picture parameters:

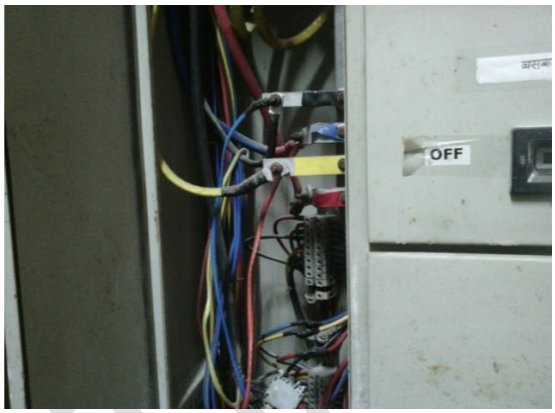
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	19.9	0.95	20.0	CenterSpot
Cold spot 1	16.7	0.95	20.0	-
Hot spot 1	28.5	0.95	20.0	-

File:	IR002069 busbar.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:25:27





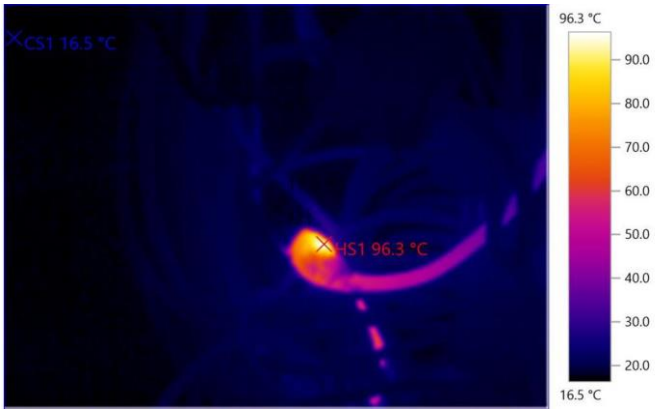
Picture parameters:

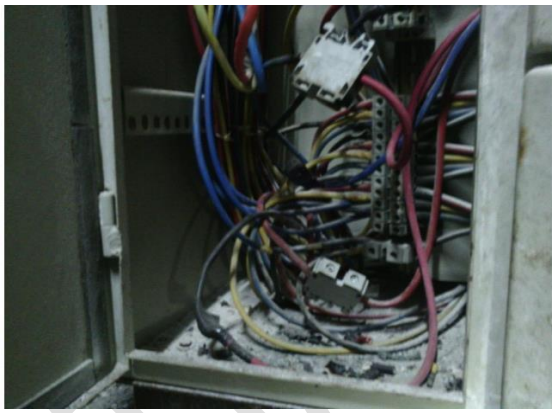
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.3	0.95	20.0	CenterSpot
Cold spot 1	16.5	0.95	20.0	-
Hot spot 1	19.5	0.95	20.0	-

File:	IR002070 floor db.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:26:07





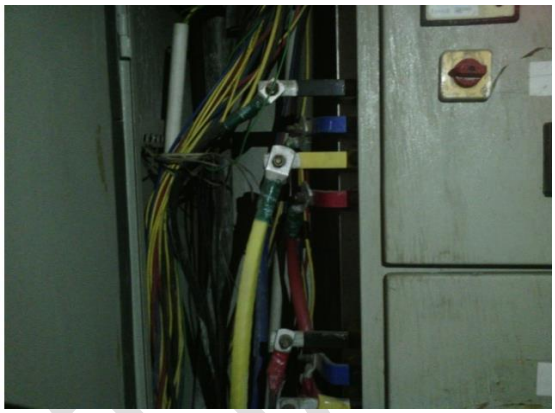
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.6	0.95	20.0	CenterSpot
Cold spot 1	16.5	0.95	20.0	-
Hot spot 1	96.3	0.95	20.0	-

File:	IR002071 engineering-3 mdb.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:29:43



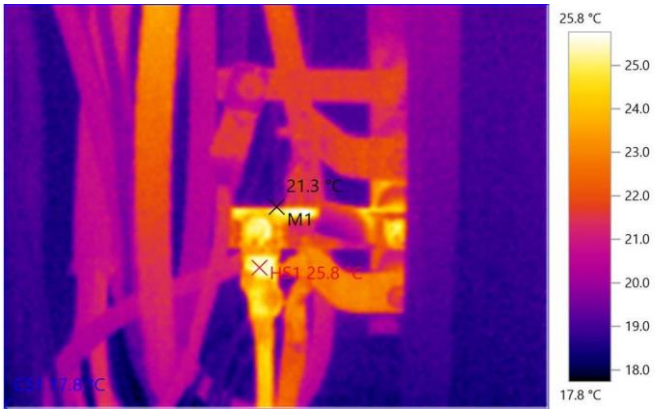
Picture parameters:

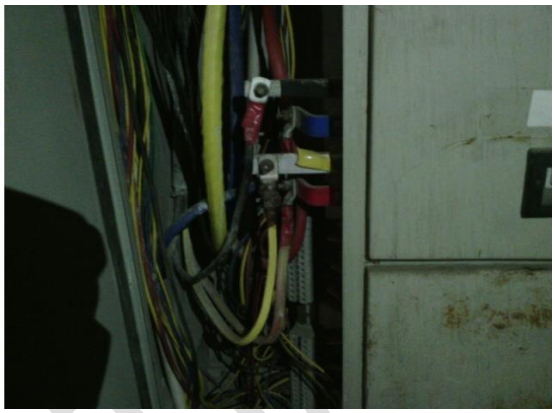
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	24.3	0.95	20.0	CenterSpot
Cold spot 1	18.3	0.95	20.0	-
Hot spot 1	31.3	0.95	20.0	-

File:	IR002072 ramp busbar.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:29:50





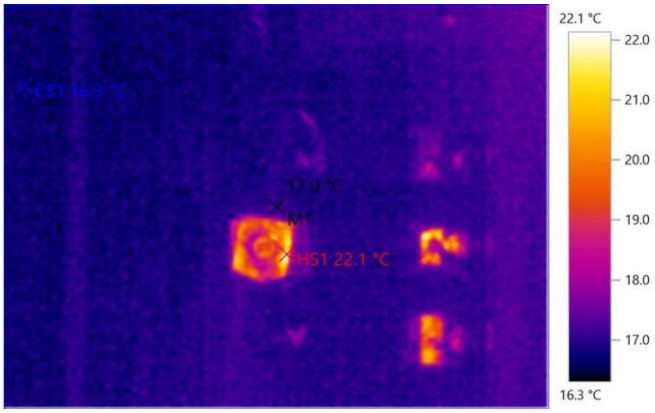
Picture parameters:

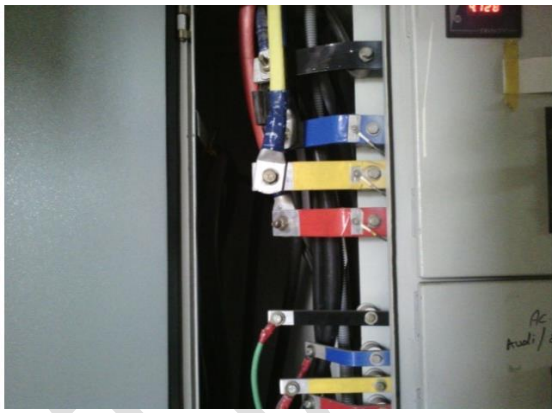
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	21.3	0.95	20.0	CenterSpot
Cold spot 1	17.8	0.95	20.0	-
Hot spot 1	25.8	0.95	20.0	-

File:	IR002073 auditorium main switch.BMT	**Date:**	28-12-2023
lens type:	31° x 23° **lens serial no.:**	**Time:**	14:36:42





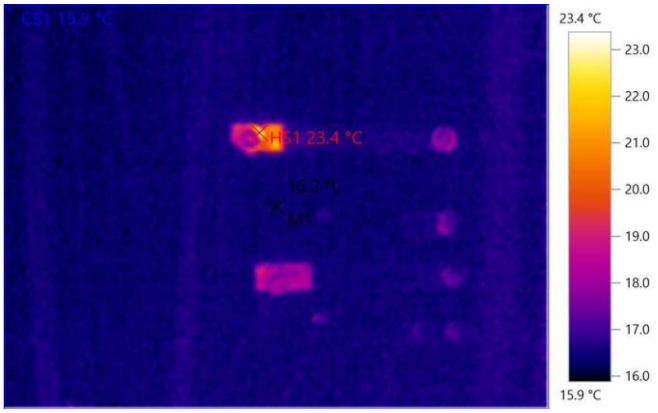
Picture parameters:

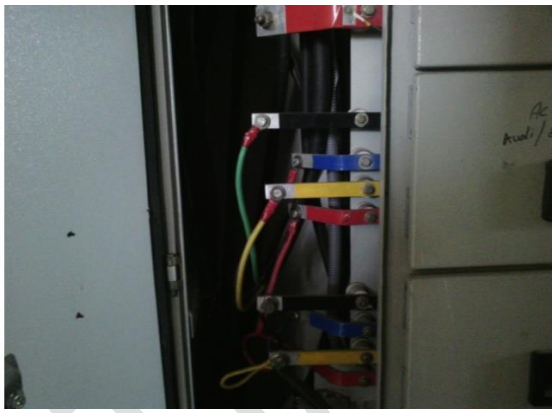
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.0	0.95	20.0	CenterSpot
Cold spot 1	16.3	0.95	20.0	-
Hot spot 1	22.1	0.95	20.0	-

File:	IR002074 auditorium main switch img-2.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:36:52





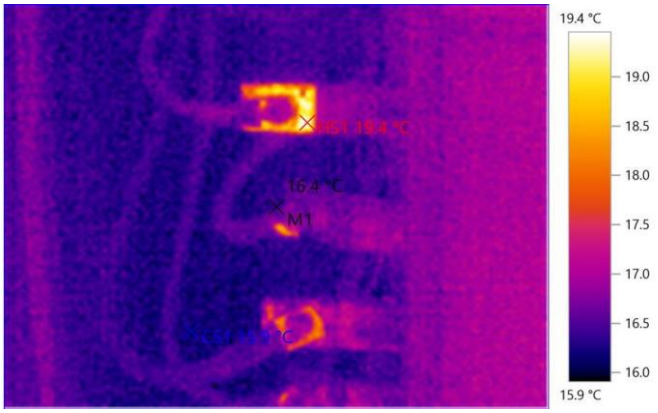
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.2	0.95	20.0	CenterSpot
Cold spot 1	15.9	0.95	20.0	-
Hot spot 1	23.4	0.95	20.0	-

File:	IR002075 CPS building MDB.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:57:49



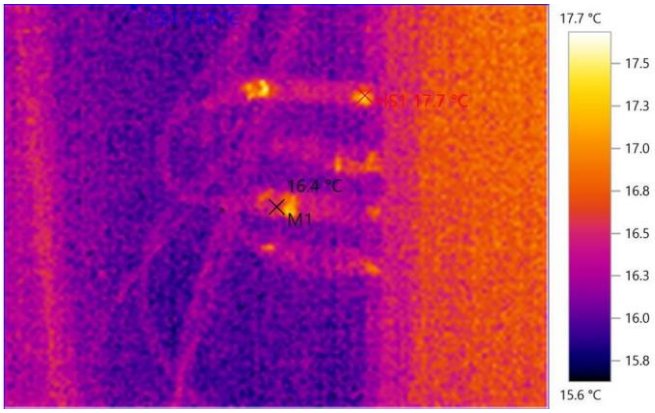
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.4	0.95	20.0	CenterSpot
Cold spot 1	15.9	0.95	20.0	-
Hot spot 1	19.4	0.95	20.0	-

File:	IR002076 lift db.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	14:57:57



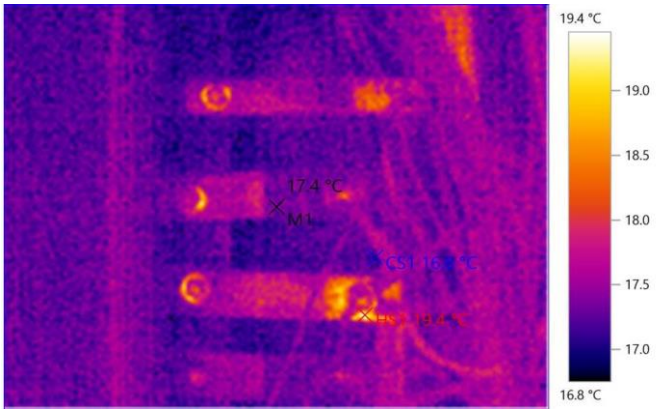
Picture parameters:

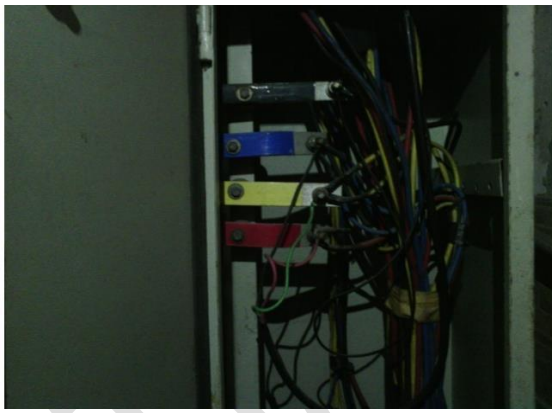
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.4	0.95	20.0	CenterSpot
Cold spot 1	15.6	0.95	20.0	-
Hot spot 1	17.7	0.95	20.0	-

File:	IR002077 CPS First floor db.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:58:33





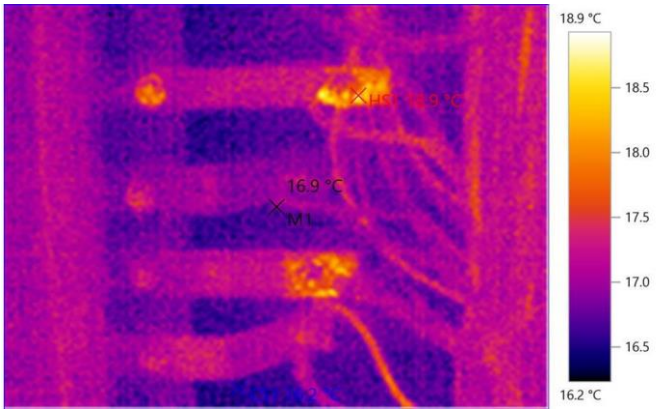
Picture parameters:

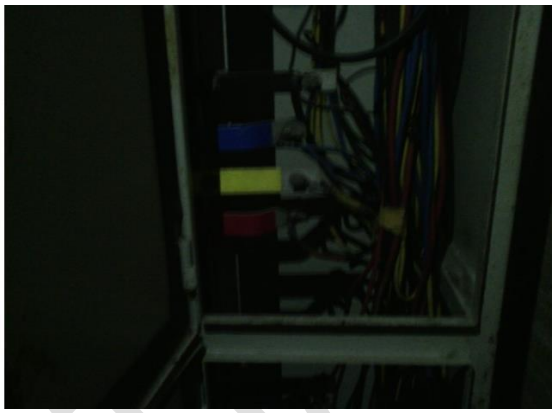
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.4	0.95	20.0	CenterSpot
Cold spot 1	16.8	0.95	20.0	-
Hot spot 1	19.4	0.95	20.0	-

File:	IR002078 2nd floor DB.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:58:43





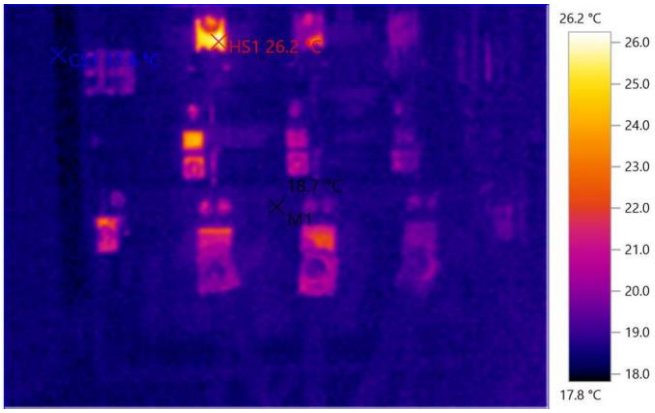
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.9	0.95	20.0	CenterSpot
Cold spot 1	16.2	0.95	20.0	-
Hot spot 1	18.9	0.95	20.0	-

File:	IR002079 newgen building mdb.BMT	**Date:**	28-12-2023
lens type:	31° x 23° **lens serial no.:**	**Time:**	15:03:05



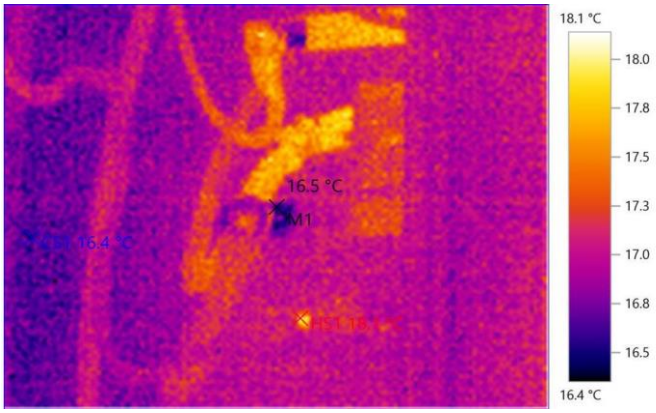
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	18.7	0.95	20.0	CenterSpot
Cold spot 1	17.8	0.95	20.0	-
Hot spot 1	26.2	0.95	20.0	-

File:	IR002080 arjun hostel mdb.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	15:10:24



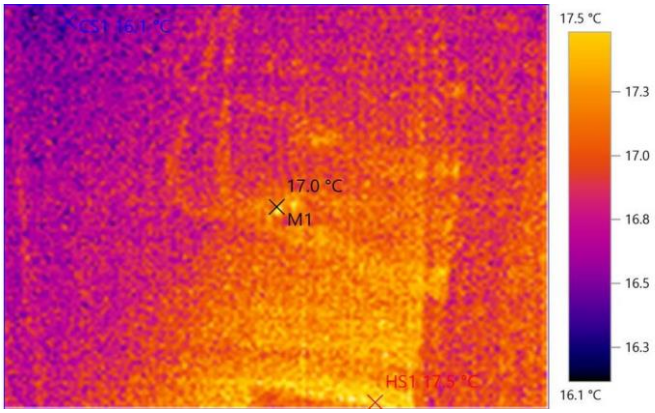
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.5	0.95	20.0	CenterSpot
Cold spot 1	16.4	0.95	20.0	-
Hot spot 1	18.1	0.95	20.0	-

File:	IR002081 lift db.BMT			**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	15:10:38



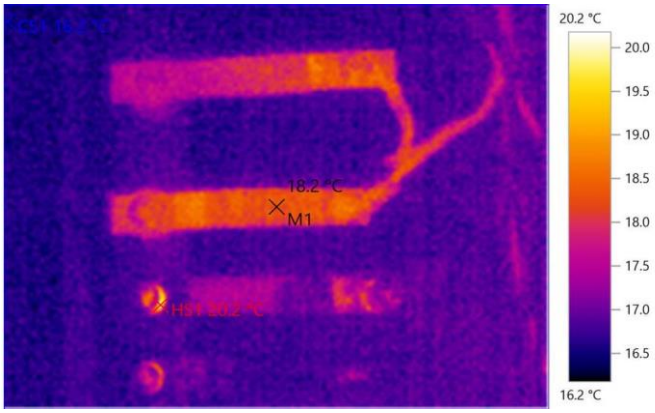
Picture parameters:

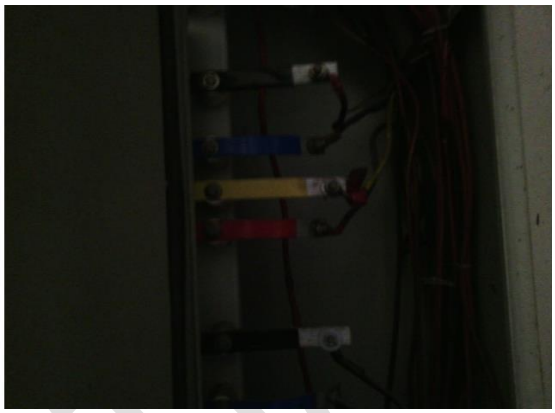
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.0	0.95	20.0	CenterSpot
Cold spot 1	16.1	0.95	20.0	-
Hot spot 1	17.5	0.95	20.0	-

File:	IR002082 floor-1.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	15:11:00





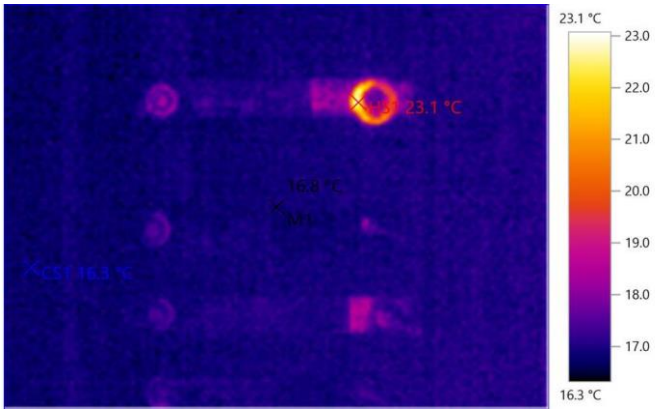
Picture parameters:

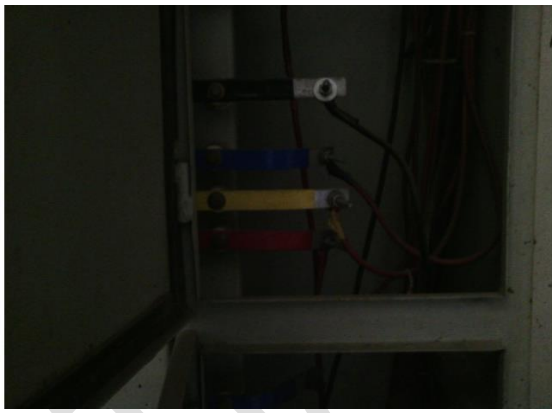
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	18.2	0.95	20.0	CenterSpot
Cold spot 1	16.2	0.95	20.0	-
Hot spot 1	20.2	0.95	20.0	-

File:	IR002083 floor-2.BMT	**Date:**	28-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	15:11:18





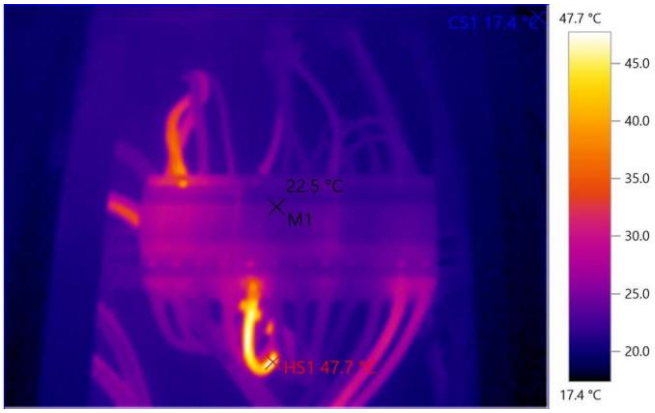
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	16.8	0.95	20.0	CenterSpot
Cold spot 1	16.3	0.95	20.0	-
Hot spot 1	23.1	0.95	20.0	-

File:	IR002084 boys hostel floor.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	11:47:42



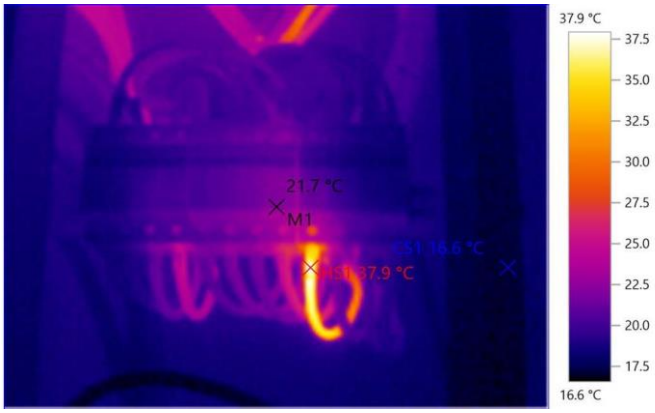
Picture parameters:

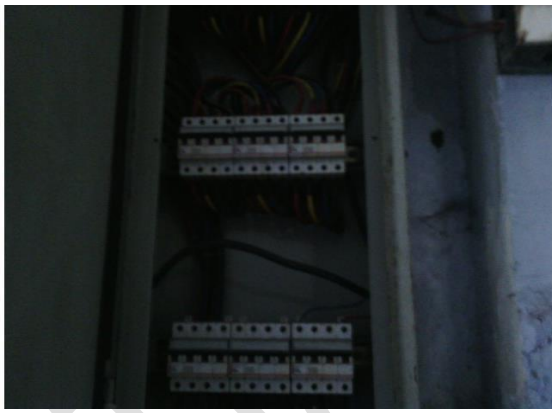
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	22.5	0.95	20.0	CenterSpot
Cold spot 1	17.4	0.95	20.0	-
Hot spot 1	47.7	0.95	20.0	-

File:	IR002085 boys hostel floor img-2.BMT			**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**		**Time:**	11:47:54





Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	21.7	0.95	20.0	CenterSpot
Cold spot 1	16.6	0.95	20.0	-
Hot spot 1	37.9	0.95	20.0	-

File:	IR002086 swarkar hostel mdb.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	**Time:**	14:25:57

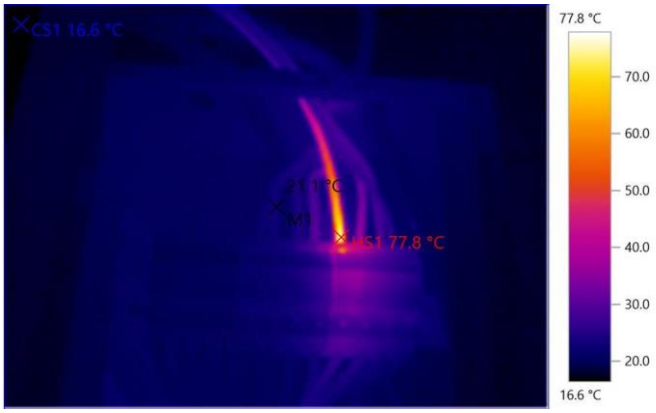
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	19.0	0.95	20.0	CenterSpot
Cold spot 1	16.1	0.95	20.0	-
Hot spot 1	32.5	0.95	20.0	-

File:	IR002087 Savarkar hostel main dbimg-2.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:26:16



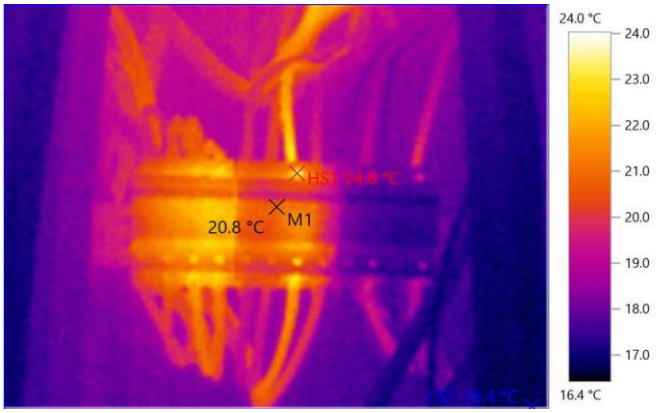
Picture parameters:

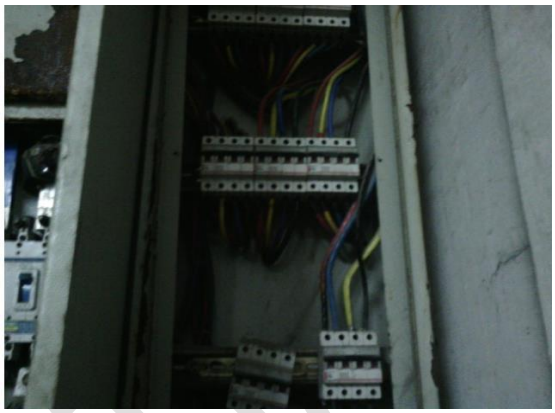
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	21.1	0.95	20.0	CenterSpot
Cold spot 1	16.6	0.95	20.0	-
Hot spot 1	77.8	0.95	20.0	-

File:	IR002088 swarkar hostel mdb.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:26:27





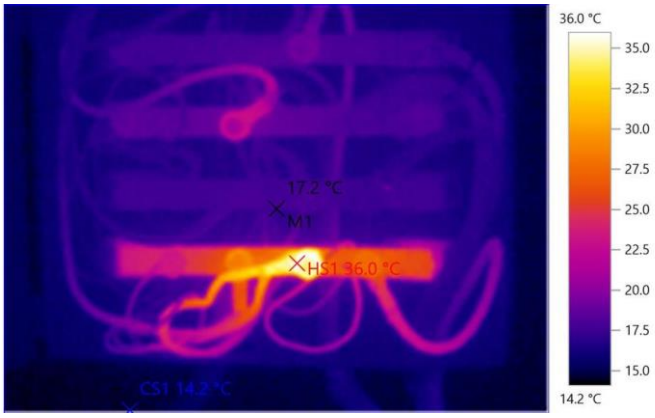
Picture parameters:

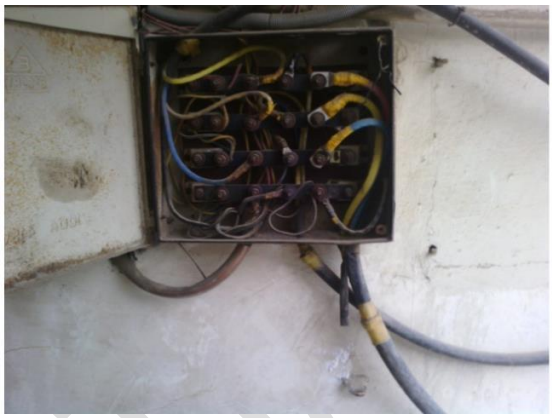
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	20.8	0.95	20.0	CenterSpot
Cold spot 1	16.4	0.95	20.0	-
Hot spot 1	24.0	0.95	20.0	-

File:	IR002089 staff block A.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:44:49





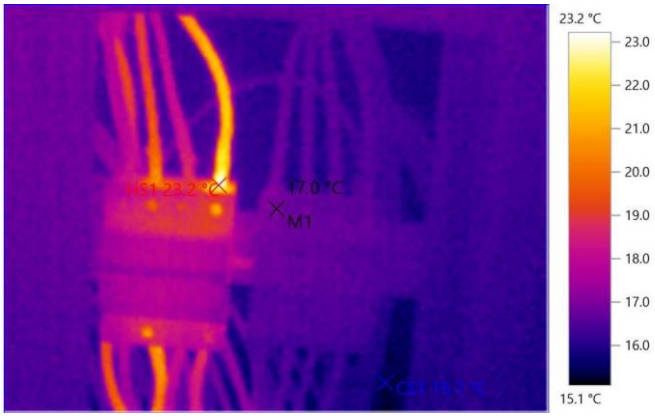
Picture parameters:

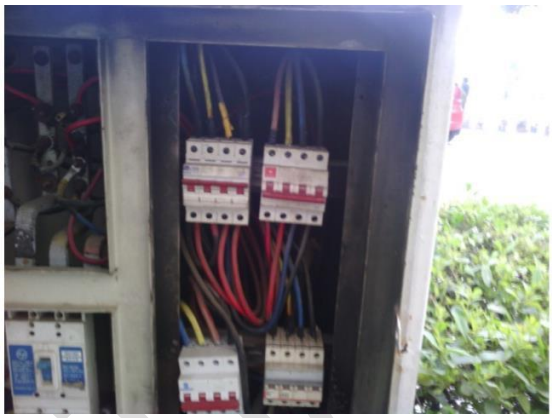
Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.2	0.95	20.0	CenterSpot
Cold spot 1	14.2	0.95	20.0	-
Hot spot 1	36.0	0.95	20.0	-

File:	IR002090 staff block-b.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:46:09





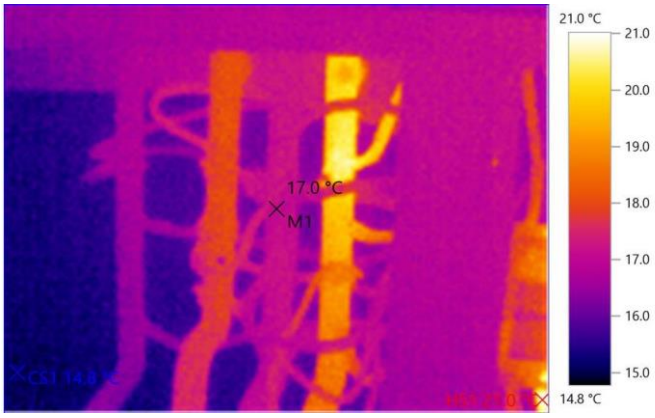
Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.0	0.95	20.0	CenterSpot
Cold spot 1	15.1	0.95	20.0	-
Hot spot 1	23.2	0.95	20.0	-

File:	IR002091 staff block-c.BMT	**Date:**	29-12-2023
lens type:	31° x 23°	**lens serial no.:**	
		Time:	14:46:14



Picture parameters:

Emissivity:	0.95
Refl. temp. [°C]:	20.0

Picture markings:

Measurement Objects	Temp. [°C]	Emiss.	Refl. temp. [°C]	Remarks
Measure point 1	17.0	0.95	20.0	CenterSpot
Cold spot 1	14.8	0.95	20.0	-
Hot spot 1	21.0	0.95	20.0	-

1. WATER MANAGEMENT

INTRODUCTION

All the water requirement of the campus is fulfilled by the ground water. The college has its own rain water harvesting pit-2 nos in the campus itself. As informed by management, Rain water stored and used in greenery system.it is a good initiative taken by management of water management.

RAIN WATER HARVESTING

SOLAR WATER HEATER

Solar water heaters use natural sun light to heat water. This system works on the thermosiphon principle and is designed to provide hot water without consuming expensive electricity. This is the most effective way to generate hot water thereby saving costly power and is also environment friendly. The extra thick SS inner tank & high density PUF insulation makes owning the Havells Solero a superior choice ensuring years of trouble-free hot water for you and your family. During energy audit at site it is observed that the client has installed solar water heater panel to fulfil hot water requirement in hostel facilities of 6 nos each of 3kw which is a good practice to save energy.

References images:


AMITY
UNIVERSITY
SHIV SHAKTI SOLAR


SHIV SHAKTI SOLAR

1. WASTE MANAGEMENT

6.1 SOLID WASTE MANAGEMENT

Solid waste generated from campus includes mainly stationary waste, wet (food/ organic) waste and E-waste.

- Waste bins are provided on each floor, in staff rooms, offices, washrooms, kitchen and in campus area. Coloured/segregated dustbins are provided in the premises. Segregation of wet and dry waste is practised in the campus.
- College strictly follows the guidelines regarding plastic usage and has prohibited the use of single use plastic.
- Being a college with hostel/residential facility, good quantity of wet (food/ organic) waste is generated in the premises. Biodegradable wet waste is mostly generated from the canteen and cafeteria. Organic waste generated must be sent to municipal corporation for processing or to be utilised in composting.
- Since there are a lot of trees and greenery around the campus, a lot of organic/horticulture waste is produced due to leaf fall.
- College should initiate the process of installing a Bio-Gas unit for the treatment of canteen waste and horticulture waste.
- By products of Bio-Gas plant can be utilised as fertilizer in the gardens and the natural gas can be utilised in the kitchen for cooking.

6.2 E- WASTE MANAGEMENT

E- waste is broadly comprised of discarded computer monitors, motherboards, mobile phones and chargers, compact discs, headphones, Printed Circuit Boards (PCB), televisions etc. College is digitized to a large extent. This includes classrooms, library, projectors for academic work etc.

- College has enough electronic equipment such as computers, projectors, air conditioners etc. in working condition.
- The e-waste generated is being stored by the management and then auctioned to an authorised licenced dealer for recycling.
- College also stores the discarded Lead Acid Batteries for their like safe disposal. These batteries should be disposed of properly after use as mishandling of batteries can lead to leakage of Lead into the environment.

Solid waste management by making vermicompost

Food management slogan


इतना ही लो
थाली में
व्यर्थ न जाये
नाली में
ANTI RAGGING
Dr. Sanjay Yadav
Dr. O.P Chaudhary
Dr. Ashish Kumar
Dr. Monika Jain
Dr. Deepa Singh
National Anti Ragging
NAME OF OFFICIAL/OFFICE
S.S.P. DISTT. G.B. NAGAR
S.P. (RURAL) GR. NOIDA
CO (I) GR. NOIDA
P.S. KNOWLEDGE PARK
PCR VAN KP - 3
POLICE CONTROL ROO
FIRE STATION KNOWLED
PLEASE WEAR YOUR FACE MASK
PLEASE KEEP SOCIAL DISTANCING

GREENSTAR
E-WASTE RECYCLING

S. No. 0135 Date: 12-08-2023

CERTIFICATE OF E-WASTE RECYCLING

This is to certify that green star e-waste recycling

ITS Engineering College, Greater Noida, Plot No. 46,
Knowledge Park III, UP- 201310

has been disposed off by or R2 Certified Facility in an environment friendly manner

E-Waste: 550KG

For Green Star Recycling

GREEN STAR E-WASTE RECYCLING MEERUT

Authorised Signatory

E-Waste Management | Secured Date / Destruction | Lamp Recycling | Skill Development

Authorisation No. : 9/A-5/E-WASTE-1486/2022

Registered Office : Khasra No. 394, Village-Achchharonda, Industrial Area, Meerut-250003, UP
Mob.: +91 9958296755 E-mail : info@greenstarewaste.com Web. : www.greenstarewaste.com


Reg. No. 01/C-4/Mathura/126/17,02.03.17
Certificate Number 2913/2019
Issued Date: 04-12-2019
www.EWRI.in
E-Waste Recyclers India
Government Authorized
ISO 9001:2015 & 14001:2015/ OHSAS 18001:2007
CERTIFICATE OF DESTRUCTION
Dear Associate to our Green Earth program
This is to certify that e-waste received from ITS Engineering College And ITS Dental College(Unit Of Durga Charitable Society)
Address: Plot No. 46/47,Knowledge park-III, Greater Noida- 201308
has been disposed off in an environment friendly manner.
Description: E-Waste Scrap
Weight: 4321 Kg MRN/EWRI No:067/3314/3315, Dated :- 22-11-2019
We thank you for your efforts in contributing to a Green Environment.
Authorized Signatory
EWRI
Works Manager
EWRI
Registered Care
CB-035-MS
R2 Responsible Recycling
IAF
cpcb
FACILITY : E-50 UPSIDC, KOSI KOTAWAN, DISTT.MATHURA - 281403 (U.P)
Toll Free:-1800-102-5679 / Customer Care:-011-4000-0000
ewaste@ewri.in www.ewri.in
Dec 29, 2023, 2:51 PM

2.GREEN STEPS TAKEN BY CAMPUS

7.1 OBSERVATIONS

College campus was audited with respect to the Checklist developed by Inventum Power Private Limited. Based on the data available for review, it is understood that college is actively taking initiatives in environment related activities. College has taken green initiatives by planting a different types of greenery plant which are mention in given table:

Scientific Name	Quantity
Musa paradisiaca Linn	5
Aegle mamelons Correa	1
Emblica officinalis Garten	5
Psidium guajava Linn	25
Karelia Africana	27
Cocos nucifera (L.)	2
Mangifera indica	20
Syzygium cumin L	10
Neolamarckia	20
cadamba	1
Citrus limon	10
Tamarindus indica	20
Combretum Indicum	1
Magnolia Cham paca	10
Artboards hexapodous	20
Hibiscus rosa-sinensis	200
Dypsis latescence	10
Rhaphis excelsa	4000
Arecaceae	160
Coccinia grandis	100
Hyophorbe lagenicaulis	155
phakas phora	150
phakas benging	100
Coccinia grandis	25
Capsicum	250

Scientific Name	Quantity
Delo nix regia	500
Sarasa asoca	300
Terminalia arjuna	30
Azadirachta indica	290
Tecoma	16
Dahlia pinnata	85
Cycas	150
Washingtonia	500
Catharanthus roseus	10
Dalbergia sissoo	8
Ficus benghalensis	200
Cestrum nocturnum	2
Bauhinia variegata	6
Grevillea robusta	2
Tagetes	30
Dahlia pinnata	40
Chrysanthemum morifolium	2
Ocimum tenuiflorum	250
Moringa oleifera	200
Nerium oleander	100
Rosa	100
Polianthes tuberosa	20
Bougainvillea spectabilis	70
Caesalpinia pulcherrima	2
Havila patents	25
houttuynia cordata	2
Tagetes	250

ENVIRONMENTAL AUDIT QUESTIONNAIRE

CAMPUS

Sl. No.	Which of the following are available in your institute?	
1	Garden area	Available
2	Play ground	Available
3	Kitchen	Available
4	Toilets	Available
5	Garbage Or Waste Store Yard	Available
6	Laboratory	Available
7	Canteen	Available
8	Hostel Facility (numbers)	Available,
9	Guest House	Not Available
	Which of the following are found near your institute?	
10	Municipal dump yard	Not in vicinity of institute
11	Garbage heap	No Garbage heaps
12	Public convenience	Yes
13	Sewer line	Yes
14	Stagnant water	No stagnant water
15	Open drainage	No
16	Industry – (Mention the type)	NA
17	Bus / Railway station	Faraway from campus
18	Public halls	Yes

WASTE MINIMIZATION AND RECYCLING

Sl. No.	WASTE MINIMIZATION AND RECYCLING	
1	Does your institute generate any waste? If so, what are they?	Yes, Solid waste, Canteen waste, paper waste, plastic waste, toiletry waste, Horticulture Waste, etc.
2	What is the approximate amount of waste generated per day? (In Kilograms/month) (approx.)	Bio Degradable - 50 Kg Non-Biodegradable - 10 Kg Hazardous - NA Others - 6 Kg
3	How is the waste generated in the institute managed? By 1 Composting 2 Recycling 3 Reusing 4 Others (specify)	Sewage water is discharged to public Sewer. Domestic Waste is given to Municipal Corporation. Two types of Waste bins are provided at campus for biodegradable and non-biodegradable waste.
4	Do you use recycled paper in institute?	Yes, in academic evaluation works
5	Do you use reused paper in institute?	Yes
6	How would you spread the message of recycling to others in the community? Have you taken any initiatives? If yes, please specify.	Yes, Green Society carried out numerous activities. Recycling campaigns, e waste management, Anti-plastic campaigns, Varsha Vriksharopan, sustainable goal awareness programme.
7	Can you achieve zero garbage in your institute? If yes, how?	Yes, as per new waste management rules all kind of waste is managed in an adequate manner without any deviation.

GREEN CAMPUS

Sl. No.	GREENING THE CAMPUS	
1	**Is there a garden in your institute?**	**Yes**
2	Do students spend time in the garden?	2-3 Hours during winters
3	Total number of Plants in Campus Grass Cover	Plant type Approx. number, Trees and plants More than 1000,
4	Suggest plants for your campus. (Trees, vegetables, herbs, etc.)	Ashoka, Ficus Religiose, Boganvellia, Alovera, Azadirachta indica, and many more as per geographical regime.
5	Is the College campus have any Nursey Department	Yes
6	Number of Staff working in Nursey Department	4-5
7	Number of Tree Plantation Drives organized by college per annum. (If Any)	Yes, Three Tree Plantation Drives are Organized Annually.
8	Number of Trees Planted in Last FY.	NA
9	Survival Rate	90%
10	Plant Distribution Program for Students and Community	Yes

ENERGY

Sl. No.	ENERGY	
1	List few ways that you use energy in your institute. (Electricity, LPG, firewood, others). Using this list, try to think of ways that you could use less energy every day.	Electricity is saved by use of LED bulbs for illumination, for HVAC System, LPG is saved by use of Pressure cookers for cooking food.
2	Is there any energy saving methods employed in your institute? If yes, please specify. If no, suggest some	Use of Natural Lights and Natural Ventilation is promoted.
3	How many CFL/LED bulbs has your institute installed?	90 % of Total Conventional bulbs are replaced by LED Lights.
4	Are any alternative energy sources employed / installed in your institute? (Photovoltaic cells for solar energy, windmill, energy efficient stoves, etc.,) Specify.	No.
5	Do you run “switch off” drills at institute?	Yes
6	Are your computers and other equipment’s put-on power-saving mode?	Yes, In Practice
7	Does your machinery (TV, AC, Computer, weighing balance, printers, etc.) run on standby modes most of the time? If yes, how many hours?	No

WATER CONSERVATION

Sl. No.	WATER CONSERVATION	
1	List uses of water in your institute	Basic usage of water in campus are; Drinking, Gardening, Kitchen & Toilets, and Others.
2	How does your institute store water? Are there any water saving techniques followed in your institute?	Underground Water tank installed for storage of water. Avoid overflow of water-controlled valves are provided in water supply system.
3	If there is water wastage, specify why and How can the wastage be prevented / stopped?	Yes, STP Under Construction so waste water goes to the open Field area.
4	Locate the point of entry of water and point of exit of waste water in your institute.	Entry- Water comes from Ground Water supply at campus Exit- From Water Drainage to the back side through pipe
5	Write down few ways that could reduce the amount of water used in your institute	By Following ways: 1. RWH, Close the taps after usage 2. Maintenance and monitoring of valves in supply system to avoid overflow, leakage and spillage 3. Water Conservation awareness for new students
6	Record water use from the institute water meter for six months (record at the same time of each day). At the end of the period, compile a table to show how many litres of water have been used.	There is no record for the ground water only for assumption bases. No meter Available.
7	Does your institute harvest rain water?	4 number of old rain water harvesting system are available. But not working properly. There is no use for rain water.
8	Is there any water recycling System.	No

CLEAN AIR

Sl. No.	CLEAN AIR	
1	Are the Rooms in Campus being Well Ventilated?	Yes
2	Window Floor ratio of the Rooms	Very Good
5	No. of vehicles more than five years old	No
6	No. of Air-conditioned vehicles	NA
7	PUC done	Yes
8	Specify the type of fuel used by your school's vehicles:	CNG, Electricity
9	Diesel	NA
10	Petrol	NA
11	CNG	Yes
12	LPG	NA
13	Electric	Yes
14	Air Quality Monitoring Program (If Any)	No monitoring is being done
15	Students suffer from respiratory ailments? (If Any)	No
16	Details of Genset	Yes, 2 Number of Genset - model, Cummins; The capacities of DG are (500) KVA.82.5 KVA,

ANIMAL WELFARE

Sl. No.	ANIMAL WELFARE	
1	List the animals (wild and domestic) found on the campus (dogs, cats, squirrels, birds, insects, etc.	More than 500 Squirrels are found in the campus, approx. 18 dogs, 0 cats and around 40 Monkey including butterflies, insects, bees, earthworms, Ducks, Chickens etc. are there in campus.
2	How many dogs in your area have undergone Animal Birth Control - Anti Rabies (ABC - AR)?	Data Not available

ENVIRONMENTAL LEGISLATIVE COMPLIANCE

Sl. No.	ENVIRONMENTAL LEGISLATIVE COMPLIANCE	
1	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2	Does your institute have any rules to protect the environment? List possible rules you could include.	They have banned single use plastic. Their environment policy includes awareness, and environmental conservation efforts through Green Society and Department of Environmental Sciences.
3	Does Environmental Ambient Air Quality Monitoring conducted by the Institute?	NA
4	Does Water and Waste water Quality monitoring conducted by the Institute?	Yes, only for Drinking Water
5	Does stack monitoring of DG sets conducted by the Institute?	No
6	Is any warning notice, letter issued by state government bodies?	No
7	Does any Hazardous waste generate by the Institute?	No
8	Does any Bio medical waste generate by the Institute? If yes explain its category and disposal method	No

GENERAL

Sl. No.	GENERAL	
1	Are you aware of any environmental Laws pertaining to different aspects of environmental management?	Yes
2	Does your institute have any rules to protect the environment? List possible rules you could include	Yes, there are some rules like banned single use plastic. Their Environmental Policy includes awareness and environmental conservation.
3	Does housekeeping schedule in your campus?	Yes, Swatch Bharat movement
4	Are students and faculties aware of environmental cleanliness ways? If Yes Explain.	Yes, periodically pollution reduction, plantation, energy conservation awareness campaigns carried out by institute
5	Does Important Days Like World Environment Day, Earth Day, and Ozone Day etc. eminent in Campus?	Yes
6	Does Institute participate in National and Local Environmental Protection movement?	Yes, Swatch Bharat Abhiyan by students at campus.
7	Does Institute have any Recognition/ certification for environment friendliness?	No
8	Does Institute use renewable energy?	No
9	Does Institution conduct a green/environmental audit of its campus?	Yes, this is first environmental audit done by the College.

References images


RECEPTION

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