



# CERTIFICATE

This is to Certify that  
**Environmental Management System**  
of

**I.B. COLLEGE, PANIPAT**  
(ESTD. 1956)

G.T.ROAD, PANIPAT-132103 (HARYANA), INDIA

has been independently assessed by DBS  
and is compliant with the requirement of:

**ISO 14001:2015**

For the following scope of activities:

***IMPARTING HIGHER EDUCATION TO UNDERGRADUATE AND  
POSTGRADUATE STUDENTS IN DIVERS AREAS OF ACADEMICS AND  
TO PROVIDE FURTHER SUPPORT SERVICES***

**Certificate Number: Draft**

<b>Date of Certification:</b>	<b>13th October 2021</b>
<b>1<sup>st</sup> Surveillance Audit Due:</b>	<b>12th October 2022</b>
<b>2<sup>nd</sup> Surveillance Audit Due:</b>	<b>12th October 2023</b>
<b>Certificate Expiry:</b>	<b>12th October 2024</b>

This Certificate is property of DBS Certifications and remains valid  
subject to satisfactory surveillance audits

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Head of Certification



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no.-2630

Date'- 11/07/23



## Certificate for promoting Green Energy

This certificate is awarded to

**I.B. (PG) College, G.T. Road, Panipat**

in recognition of the successful installation of a Solar Power Plant-50 KW and hence contributing significantly to energy conservation efforts in the college premises by promoting Green Energy.

This achievement demonstrates the college's commitment to sustainable practices and the advancement of renewable energy sources. By harnessing the power of solar energy, the college has taken a significant step towards reducing its carbon footprint and promoting a cleaner and greener environment.

The solar power plant installed at the college has made a significant impact on energy conservation, providing a reliable and sustainable source of electricity. The efforts put forth by I.B. (PG) College, G.T. Road, Panipat in embracing solar energy as an alternative power source are commendable. By adopting this eco-friendly solution, the college has set a remarkable example for other educational institutions to follow in their quest for a more sustainable future.

This certificate is presented to I.B. (PG) College, G.T. Road, Panipat as a testament to their commitment to energy conservation and sustainable practices.

The Department of New & Renewable Energy, Panipat extends heartfelt congratulations and best wishes to I.B. (PG) College, G.T. Road, Panipat for their outstanding achievements in energy conservation.

**Project Officer  
New & Renewable Energy Deptt.  
Panipat ✓**





हर घर तिरंगा



75  
आज़ादी का  
अमृत महोत्सव

# जिला प्रशासन, पानीपत

## प्रशस्ति पत्र

श्री/श्रीमती/कुमारी

उमजय कुमार गर्ग

पुत्र/पुत्री/पत्नी श्री

प्रधानाचार्य, आई० बी० (पी० जी०) कॉलेज, पानीपत

पद/विभाग

को पर्यावरण संरक्षण में योगदान के कार्य में उत्कृष्ट उपलब्धि के लिए

जिला स्तरीय स्वतन्त्रता दिवस समारोह 2022 में माननीय मुख्यमंत्री जी द्वारा प्रदान किया गया।

“शुभ कामनाओं सहित”

उपायुक्त पानीपत

15 अगस्त 2022



An ISO 14001, 9001 & 45001 Certified Company

# Certificate OF SAFE DISPOSAL

SDC No.: ERPL: 2029

Date: 27.12.2019

This is to certify that the materials picked from  
Old Housing Board Colony, Prakash Nagar, Haryana 132103  
**For, IB College, Panipat**  
as per details given below have been

Disposed off in an environmentally safe and secure manner by Exigo Recycling Pvt. Ltd.

ITEM	Item Description	Collection Date	Our Receiving Details	Final Recycling Date	Quantity
E-waste	Desktop, Monitor, etc.	27.12.2019	MRN No. ERPL-2062N	23.12.2019	325 Kgs.

The Items mentioned above have been disposed off in an environmentally safe manner as per the prescribed norms of the Company and the rules laid down by the Pollution control authorities.  
This Safe Disposal Certificate includes the activities of collection, transportation, storage, dismantling and treatment using mechanical/manual process wherein the elements are recovered from the Items mentioned above and converted into raw materials for future manufacturing of new products. The Items mentioned above are no longer fit for their original purpose and have been recycled and turned into raw materials and sent to the manufacturing industry.

Our Pollution Control Board: Passbook Authorization No.: HSPCB/PR/2019/1921 dt. 26.09.2019 valid till 09.08.2024



*Devi*

For, Exigo Recycling Pvt. Ltd.  
(Authorized Signatory)



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**Quality Management System**  
of

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(ESTD. 1956)

G.T.ROAD, PANIPAT-132103 (HARYANA), INDIA

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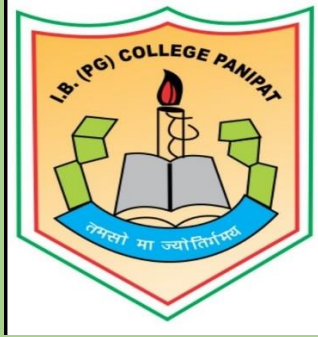
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2021-22

# Green & Energy Audit Report



**I.B. COLLEGE, PANIPAT  
G.T. ROAD, PANIPAT  
HARYANA-132103**





**CHANGE FOR  
GREEN**

GREEN IS NO LONGER AN OPTION.  
IT'S THE ONLY WAY FORWARD...

**SAVE THE EARTH**

**BECOME A GREEN CITIZEN**

**“Whenever someone saves energy, or uses it more efficiently, he reduces the demand for oil, coal, electricity etc. Less consumption of these means lower emission of carbon dioxide in the atmosphere that is the major contributor to global warming. Your discretion in energy conservation can help emit less global warming pollution”**



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## ABBREVIATIONS

<b>AEA</b>	Accredited Energy Auditor
<b>ASSOCHAM</b>	Associated Chambers of Commerce and Industry of India
<b>ACs</b>	Air Conditioners
<b>ECRM</b>	Energy Conservation & Retrofit Measures
<b>EE</b>	Energy Efficiency
<b>EER</b>	Energy Efficiency Ratio
<b>ESCO</b>	Energy Service Company
<b>FMCG</b>	Fast Moving Commercial Goods
<b>FTL</b>	Fluorescent Tube Light
<b>GEF</b>	Global Environment Facility
<b>GHG</b>	Green House Gases
<b>GLS</b>	General Lighting Service (Incandescent Lamp)
<b>ILER</b>	Installed Load Efficacy Ratio
<b>IRR</b>	Internal Rate of Return
<b>JAPCC</b>	Jharkhand Action Plan on Climate Change
<b>kVA</b>	Kilo Volt Ampere
<b>kW</b>	Kilo Watt
<b>kWh</b>	Kilowatt Hour
<b>LED</b>	Light Emitting Diode
<b>MoEFCC</b>	Ministry of Environment, Forest and Climate Change
<b>MRV</b>	Monitoring, Reporting and Verification
<b>MTOE</b>	Metric Tonnes of Oil Equivalent
<b>MU</b>	Million Units
<b>MWh</b>	Megawatt Hour
<b>NAPCC</b>	National Action Plan on Climate Change
<b>NPV</b>	Net Present Value
<b>O&amp;M</b>	Operation and Maintenance
<b>PF</b>	Power Factor
<b>RE</b>	Renewable Energy
<b>ROI</b>	Return on Investment
<b>SAPCC</b>	State Level Action Plan on Climate Change
<b>SEC</b>	Specific Energy Consumption
<b>tCO<sub>2</sub>e</b>	Tonnes of CO <sub>2</sub> equivalent
<b>TR</b>	Ton of Refrigeration

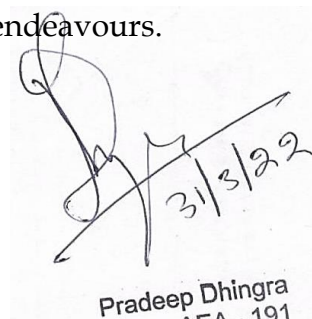
## ACKNOWLEDGMENT

We profoundly thank the officials of **I.B. College, Panipat** for entrusting us with the work of conducting Green & Energy Audit at **I.B. College, Panipat** and giving us an opportunity to be a part of spreading the awareness of Energy Efficiency and Audit of building by making it a showcase example of Green & Energy Efficient Building.

We express our immense gratitude to **Dr. Ajay Kumar Garg, Principal and Prof. Ajay Pal Singh, Asst. Prof., Deptt. of Commerce** for extending their utmost cooperation and help in coordination for Green & Energy Audit of **I.B. College, Panipat**. We are also thankful to all technical staff for their active help during data collection.

Further, we would like to express our gratitude to all the officials for providing us with the required support to complete the task successfully.

PGSEPL Team looks forward to associating with you in your future endeavours.



Pradeep Dhingra  
AEA-191

**(Accredited Energy Auditor)**

## • CORPORATE OVERVIEW OF THE AUDITING FIRM

PGS Energy Services Pvt. Ltd. is an Accredited Energy Auditor and ESCO Empanelled firm with Bureau of Energy Efficiency, (BEE), Ministry of Power, Govt. of India. The EC Act 2001 was the first major legislative Act to institutionalize energy conservation efforts. BEE and State Designated Agencies (SDAs) act as nodal agencies cum regulators for implementing the Act at National and State levels respectively to reduce *Energy Intensity in the Economy*. We are also working as Energy Professional with BEE & EESL for Perform Achieve & Trade (PAT scheme).

A well-conducted Green and energy audit would reveal areas of wastage of energy and if recommendations are implemented by the concerned organization, a significant reduction in energy consumption levels can be achieved.

We offer value added services in the field of Energy Conservation which leads to increased Efficiency and reduction in operational costs. **“Our vision is a prosperous future for our country where energy is Clean, Abundant, Reliable and Affordable.”**

### Core Activities of our business are:

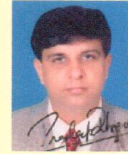
- Comprehensive Energy Audits of Electrical & Thermal utilities ,Harmonics Study & Analysis and solution to reduce harmonics , Thermography ,Noise level study of furnaces, boilers etc, Star rating of existing buildings, BPO & Hospitals
- Renewable Energy (Solar) Power projects
- Total Energy Management solution, DPR for Biomass, Co-generation, & WHRS projects
- PAT Consultancy, Mandatory Energy Audit under PAT \*
- Investment Grade Energy Audit of commercial buildings

## • PGSEPL STUDY TEAM

### Green and Energy Audit team participated in study

1. Er. Pradeep Dhingra - AEA
2. Dr. Balkar Singh - CEA
3. Miss. Mythili - CEA
4. Mr. Gautam Singh - Asst. Manager
5. Er. Upkar - Engineer
6. Er. Arjun Kumar - Engineer



AEA Certificate**BUREAU OF ENERGY EFFICIENCY**Examination Registration No. : ..... **EA-5927** .....Accreditation Registration No.: ..... **AEA-0191** .....**Certificate of Accreditation**

This is to certify that Mr./Ms..... **Pradeep Dhingra** .....having its trade/registered office at..... **Chandigarh** ..... has been given accreditation as accredited energy auditor. The certificate shall be effective from ..**9th**.. day of ..**October, 2014**.....

The certificate is subject to the provisions of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

This certificate shall be valid until it is cancelled under regulation 9 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010

On cancellation, the certificate of accreditation shall be surrendered to the Bureau within fifteen days from the date of receipt of order of cancellation.

Your name has been entered at AEA No....**0191**... in the register of list of accredited energy auditors. Your name shall be liable to be struck out on the grounds specified in regulation 8 of the Bureau of Energy Efficiency (Qualifications for Accredited Energy Auditors and Maintenance of their List) Regulations, 2010.

Given under the seal of the Bureau of Energy Efficiency, Ministry of Power, this .....**16th**..... day of **January, 2015**

Secretary,  
Bureau of Energy Efficiency  
New Delhi

## BACKGROUND & SUMMARY

The building sector in India is growing at a rapid pace and now there is an imminent need to introduce green concepts and techniques in this sector, which can aid growth in a sustainable manner. The green concepts and techniques in the building sector can help address issues like water efficiency, energy efficiency, reduction in fossil fuel use for commuting etc. Most importantly, these concepts can enhance occupant health, productivity and well-being.

IGBC's GRIHA rating system takes into account the provisions of the National Building Code 2005; the Energy Conservation Building Code 2007 announced by BEE (Bureau of Energy Efficiency) and other IS codes and evaluate the environmental performance of a building holistically over its entire life cycle, thereby providing a definitive standard for what constitutes a 'green building'.

To comply with GRIHA criteria and ECBC building norms, Green & Energy Audit is an essential step towards energy management, includes assessment of current energy performance and evaluation of energy performance index of the building.

In this view to assess the environmental impact & building energy & water usage **I.B. College, Panipat** has awarded the job of "**Green & Energy Audit of I.B. College, Panipat at G.T. Road Panipat, Haryana-132103**" to PGS Energy Services Pvt. Ltd. on as per actual year thought the competitive bidding process as per procedure in vogue.

- **I.B. College, Panipat Facility**

I.B. College, Panipat is a premier co-educational institution in Haryana. It was founded in 1956 in the memory of the well-wisher of Leiah Biradari Late Sh. Inder Bhan Dhingra. Keeping in view the requirement of education for women, Late Seth Brij Lal Dhingra with the help of his energetic friends Late Sh. Shanu Lal Narang & Late Sh. Sukh Dayal Sachdeva, founded this College for women only. In 1966, the College started working as a co-educational institute. The College progressed by leaps and bounds under the leadership of Late Dr. Somnath Dhingra and Late Sh. Ram Kishan Gandhir who worked in the capacity of erstwhile President & Vice President respectively.

At present, it has a student strength of more than 3000, with 126 teaching staff and more than 90 non-teaching staff members. The College has the honour to own a sprawling campus with well-ventilated classrooms, fully-equipped science labs, computer labs and

spacious AC seminar hall. In the pursuit for excellence, the College is constantly upgrading its infrastructure and in the same direction, construction of a new and modern science block is in full swing. The College has steadily built up over the past six decades, maintaining high traditions of scholastic excellence along with the culture of discipline and social service. The overall goal is to prepare the students to play roles in the society with responsibility and commitment.

**Electrical power:** The establishment has a 0.4 KV H.T. connection from Uttar Haryana Bijli Vitran Nigam limited. The contract demand/Electrical load of the unit is 450kW. The campus has Solar SPV of capacity 50 kWp and a backup of two Diesel Generators of 125 kVA & 70 kVA.

**Building Area:** The College have 5 blocks inside the campus including Commerce block, Arts block, BBA/BCA block, Girls wing block and Science block with a small garden at the center of the campus. The built-up area details are as below:

SN	Block	No of floors x floor area (sq. ft)	Block built up area (m <sup>2</sup> )
1	Commerce block	3 floors x 21033 sq. ft	1954 m <sup>2</sup>
2	Arts block	3 floors x 6279 sq. ft	583 m <sup>2</sup>
3	BBA/BCA block	3 floors x 5446 sq. ft	506 m <sup>2</sup>
4	Girls wing block	4 floors x 4128 sq. ft	385 m <sup>2</sup>
5	Science block	5 floors x 11412 sq. ft	1060 m <sup>2</sup>
	<b>TOTAL</b>	<b>Floor area: 173194 sq. ft.</b>	<b>Built up area: 4488 m<sup>2</sup></b>

## Critical Comments

- 1.) The I.B. College, Panipat has contracted load 450 kW and there are 2 Nos. Transformer as 1X250 KVA and 1X 200KVA transformer. During audit, load at 2<sup>nd</sup> Transformer 200KVA was very low.
- 2.) The transformer has total harmonics distortion Thdv 2.5% and Thdi 12.4 % Which are within the limits.
- 3.) The energy consumption of all utilities has been taken into consideration for EPI analysis since it is the total consumption of DG and EB power.
- 4.) 50 kWp Solar SPV power generation system commissioned at campus in February 2022. During audit, this system was not in operation.
- 5.) DG sets are used for only during emergency and grid power shut-off. A trail run was made during data collection and the performance evaluation is presented.
- 6.) We checked ACs which are inefficient and operating at Low efficiency which leads to high power consumption. It is suggested to replace with BEE 5-star models.
- 7.) Water audit is also done and its consumption and recycle details also mentioned in the report.
- 8.) College authorities maintained Solid & E waste management and the details are mentioned in the report.
- 9.) In lighting section, ILER is calculated and recommended to replace CFL and tube light with LED lights.
- 10.) The Institute have Energy Performance Index (EPI) unit as below:

Particulars	EPI (kWh/annum/m <sup>2</sup> )
As per EB bill + DG power	24 kWh/annum/m <sup>2</sup>
As per measured data of utilities installed at campus + DG power	24 kWh/annum/m <sup>2</sup>



Table 32.1 Green & Energy Audit data			
A. Energy Consumption			
SN	Item		Value
1	Name of the building	I.B. College, Panipat, Haryana	
2	Type of building (office, institution, hotel, hospital, and so on)	Institution	
3	Working hours(day working/24hour working)	8	
4	Working days/week (5/6/7 days per week)	6	
5	Area of the building (exclude parking, lawn, roads, and so on)	1. Built Up Area (m <sup>2</sup> ) (Excluding Basement Area)	4482
		2. Conditioned Area (in m <sup>2</sup> )	518.84
		3. Conditioned Area (as % of Built-Up Area)	0.30
6	Connected Load(kW) or Contract Demand(kVA)	450 kW	
7	Installed capacity of DG/GG sets (kVA or kW)	No.	2
		Capacity	125+70 kVA
8	Installed capacity of Transformers (kVA )	No.	2
		Capacity	250+50 kVA
9	Installed capacity of Air Conditioning system (TR)	22.5	
10	Installed Lighting load (kW)	20	
11	a) Annual Electricity consumption, purchased from utilities (kWh)	96612	
	b) Annual Electricity consumption, through diesel generating (DG)/ gas generating (GG) sets (kWh)	11308.8	
	c) Total annual Electricity consumption, utilities + DG/GG sets (kWh)	107920.8	
12	a) Energy consumption for lighting (kWh) (data collected from indoor lighting sub meter)	41867	
	b) Energy consumption for HVAC (kWh)	• HVAC plant/AC units (Data collected from HVAC sub meter/ AC unit)	32322.2
		• AHU fans (Data collected from AHU fans sub meter)	N/A
13	a) Annual cost of electricity purchased from utilities (Rs.) (12-month electricity bills)	1358227	
	b) Annual cost of electricity generated through DG/GG sets (Rs.)	327955	
	c) Total annual electricity cost, utilities + DG/GG sets (Rs.)	1686182.2	
14	HSD (or any other fuel oil used, specify)/ gas consumption in DG/GG sets (litres/cu metres) in the year	1860	
15	Fuel (FO, LDO, LPG, NG) used for generating steam/water heating in the year (in appropriate units)	NA	
16	<b>EPI (Energy Performance Index) Energy includes electricity purchased and generated (excluding electricity generated from onsite renewable resources)</b>	<b>kWh/m<sup>2</sup>/year</b>	<b>24</b>

During the course of the audit, we followed the standard methodology and procedures as prescribed by Bureau of Energy Efficiency (BEE) and as per the requirements of GRIHA. The basic approach followed during the audit was first to establish a rapport with the management of I.B. College, Panipat by giving them information the basic purpose of the audit and then gathering the requisite information and verifying the information provided in a systematic manner with the cooperation and support of staff as well as independent evaluation by the audit team wherever needed and feasible. The audit and preparation of report was done in an atmosphere of mutual exchange of information and ideas and mutual concurrence on the substance of final report. During the audit there was continual interaction between the staff and audit team on the various aspects of operation, equipment, maintenance and possible outcomes. This was done to ensure that any setup made regarding energy conservation and environmental benefit are as realistic and practical as possible and can be implemented with minimum disruptions to existing eco-system in a cost-effective manner within a reasonable time-frame.

The main basic steps followed during the course of the audit are as follows:

- Fixing dates for site visit and chalking out other details
- Discussions with management and staff about data collection as per scope of work
- Visit to utility & building area for collection & recording of energy data with calibrated instruments.
- Identification and study of the major energy equipment.
- Preparation of the draft audit & validation report.
- Presentation of the draft report and discussions with College management for their acceptance of the report.
- Preparation of final report with any changes if necessary and submission of report.

## • Instruments used for the study

The specialized measuring instruments that were used to support the audit investigations and analysis are listed below:

- Krykard Power Analyzers – 3 Phase & Single Phase
- Lux Meter
- Hygrometer
- Anemometer

### Instruments Used

**Figure 1: Instruments used**



#### Electrical Measuring Instruments:

These are instruments for measuring major electrical parameters such as kVA, kW, PF, Hertz, kVA<sub>r</sub>, Amps and Volts. In addition some of these instruments also measure harmonics.



#### Infrared Thermometer:

This is a non-contact type measurement which when directed at a heat source directly gives the temperature read out. This instrument is useful for measuring hot spots in furnaces, surface temperatures etc



#### Lux meters:

Illumination levels are measured with a lux meter. It consists of a photo cell which senses the light output, converts to electrical impulses which are calibrated as lux.



#### Speed Measurements:

In any audit exercise speed measurements are critical as they may change with frequency, belt slip and loading.

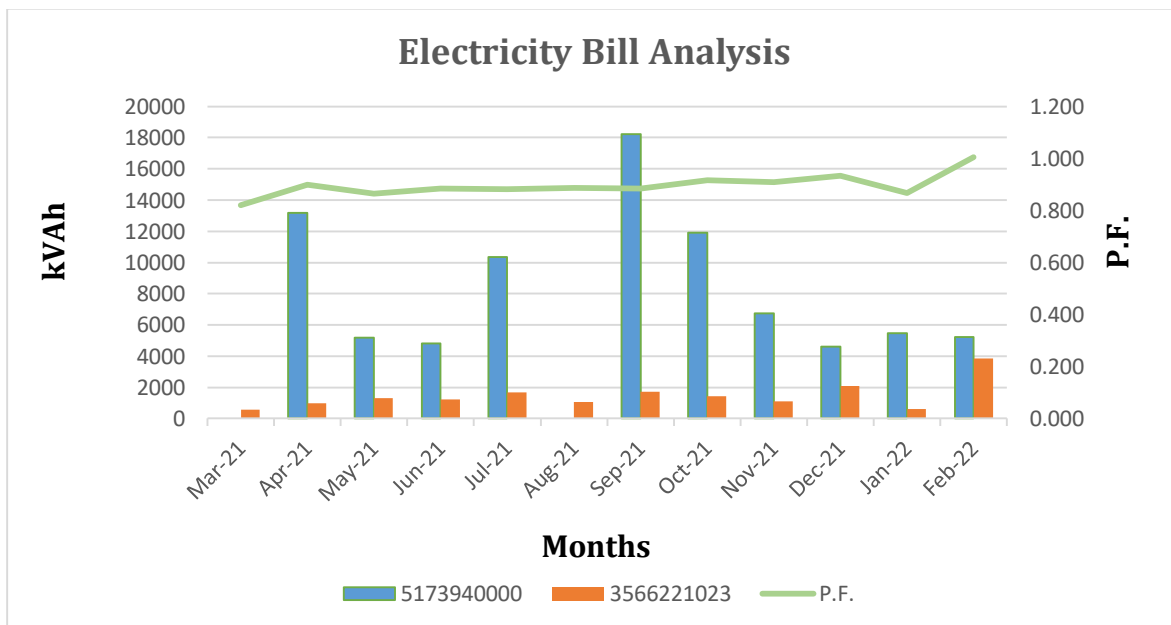
A simple tachometer is a contact type instrument which can be used where direct access is possible.

## Building Energy Bill Analysis

Auditors collected the energy bills of previous years and the details have been presented below:

**Table 1: Building Energy Bill Analysis**

Electricity Bill IB Collage Panipat - 2021												
S.N.	Month	Account No; 5173940000					Account No; 3566221023					
		kWh	kVAh	PF	SD (kVA)	MD1 (kVA)	kWh	kVAh	PF	SD (kW)	MDI (KVA)	Amount
1	Mar-21	Nil			150		460	560	0.821	49.90		
2	Apr-21	10440	13172	0.793	150	25.60	880	980	0.898	49.90	6.80	16309
3	May-21	4540	5162	0.880	150	16.80	1140	1320	0.864	49.90	8.20	17082
4	Jun-21	3842	4822	0.797	150	30.44	1080	1220	0.885	49.90	7.20	17473
5	Jul-21	10324	10362	0.996	150	63.60	1480	1680	0.881	49.90	12.40	21308
6	Aug-21	Nil			150		940	1060	0.887	49.90	8.80	14339
7	Sep-21	17906	18206	0.984	150	52.60	1520	1720	0.884	49.90	8.83	18247
8	Oct-21	11340	11890	0.954	150	59.00	1300	1420	0.915	49.90	8.52	871711
9	Nov-21	6760	6760	1.000	150	64.96	1000	1100	0.909	49.90	8.58	14363
10	Dec-21	4622	4622	1.000	150	25.60	1960	2100	0.933	49.90	8.36	152637
11	Jan-22	5476	5478	1.000	150	29.76	520	600	0.867	49.90	9.00	12315
12	Feb-22	5222	5220	1.000	150	28.76	3860	3840	1.005	49.90	7.76	202443



**Figure 2: Electricity Bill Analysis (kVAh vs Months)**



- Transformer**

IB collage has 0.40 kV LT connection with 1 no. 250 kVA and 1 no. 200 kVA transformer, both the transformers were energized at a time and share load simultaneously. Auditors have recorded the data of both the transformers and the details have been presented in enclosed annexures and observations have been mentioned below:

S. No.		1	2
Tag No.		TR - 1	TR - 2
<b>Rated Parameter</b>			
Spec.		LT Side	LT Side
Supply Voltage (kV)		0.40	0.40
Rating		250	200
Hz		50.00	50.00
<b>Measured Parameter</b>			
Voltage	R	388.5	390.2
	Y	382.0	393.4
	B	386.7	389.6
THDv (%)	R	2.7	2.5
	Y	2.9	2.2
	B	2.9	2.1
Current	R	412.3	12.7
	Y	301.6	10.2
	B	264.2	33.2
THDi (%)	R	10.6	25.9
	Y	8.5	30.7
	B	15.8	12.4
Hz		49.96	49.99
Power Factor		0.981	0.922
Measured kW		213.7	11.7
Measured kVA		217.8	12.7
MWh in 24 Hrs		5.13	0.28
Loading (%)		87.1	6.3

## Risk and Sensitivity Analysis

Auditing Team inspected Fire Sensors, Water Sprayers and Fire alarm which were working satisfactorily and also inspected cables which were found to be of appropriate size. No abrupt heating of cables was observed. The PVC coatings/insulation of the connecting wires of Sub-station panels were satisfactory.

### • Diesel Generator System

During Audit, it was observed that only one DG set was in operation and the others were on standby mode. The previous one-year data for all the two units - energy generation and fuel consumption are as below:

SN	DG Number and Location	RATING (in KVA)	Total DG kWh generation 21-22	Total Diesel Consumption (in ltr.) 21-22
1	DG-1	125	11308.8	1860
2	DG-2	70		
	<b>Total</b>	<b>195</b>	<b>11308.8</b>	<b>1860</b>

Analysis of DG set were audited by performing 15-min trail run of both units. The analysis is as below:

DG Set - 1 (125 kVA)		
Particulars	Unit	DG Set
Fuel Consumed during the test period of one hour	Lts	3
Power Generated during the test period of one hour	KWh	7.833
Load variations on the DG Set	KVA	32.4 to 36.6
DG Loading (%)	%	28 to 31%
<b>Specific Power Generation</b>	<b>KWh/ ltr</b>	<b>2.61</b>
Fuel Rate	Rs/ Ltr	86
Basic Power Generation Cost	Rs per Kwh	32.94

DG Set - 1 (70 kVA)		
Particulars	Unit	DG Set
Fuel Consumed during the test period of one hour	Lts	2
Power Generated during the test period of one hour	KWh	6.944
Load variations on the DG Set	KVA	32.4 to 36.6
DG Loading (%)	%	28 to 31%
<b>Specific Power Generation</b>	<b>KWh/ ltr</b>	<b>3.47</b>
Fuel Rate	Rs/ Ltr	86
Basic Power Generation Cost	Rs per Kwh	24.77

## 3

## 3. ELECTRICAL UTILITY LOAD

- Pumps**

S. No.	Equipment Name	Rated	Voltage	THDv %	Hz	Current	THDi %	P.F.	Measured kW	Measured kVA	(%) Loading	kWh/year
1	Water Pump - 1	3.7	388.6	1.8	50.00	9.7	5.2	0.797	5.20	6.53	128%	5432.27
2	Water Pump - 2	3.7	376.5	3.0	49.96	11.8	5.1	0.675	5.19	7.69	128%	5422.49
3	Water Pump - 3	3.7	387.9	3.6	49.98	8.6	4.6	0.701	4.05	5.78	100%	4228.48
	<b>Total</b>	<b>11.2</b>							<b>14.45</b>			<b>15083.2</b>

- Motors**

S. No.	Equipment Name	Rated	Voltage	THDv %	Hz	Current	THDi %	P.F.	Measured kW	Measured kVA	(%) Loading	kWh/year
1	Lift - 1	4.1	393.3	2.1	50.03	5.0	14.5	0.582	1.98	3.41	44%	2069.5
2	Lift - 2	4.1	394.5	2.5	50.02	4.9	20.3	0.578	1.94	3.35	43%	2020.32
	<b>Total</b>	<b>8.2</b>							<b>3.9</b>			<b>4089.82</b>

- Water Cooler**

S. No.	Equipment Name	Voltage	THDv %	Hz	Current	THDi %	P.F.	Measured kW	Measured kVA	kWh/year
1	Water Cooler - 1	223.1	3.4	49.99	2.3	11.1	0.815	0.4	0.5	284.377
2	Water Cooler - 2	213.6	4.5	49.93	1.8	9.9	0.812	0.3	0.4	212.294
3	Water Cooler - 3	221.7	3.2	49.96	2.1	10.9	0.811	0.4	0.5	256.753
4	Water Cooler - 4	220.9	4.1	49.98	2.4	9.8	0.816	0.4	0.5	294.175
5	Water Cooler - 5	219.8	3.7	49.97	1.9	10.3	0.811	0.3	0.4	230.309
6	Water Cooler - 6	214.6	3.6	49.99	2.2	10.2	0.814	0.4	0.5	261.328
7	Water Cooler - 7	215.4	3.3	49.98	2.3	10.1	0.812	0.4	0.5	273.551

8	Water Cooler – 8	217.6	3.4	49.97	2.1	10.5	0.809	0.4	0.5	251.383
9	Water Cooler – 9	218.4	4.1	49.96	2.0	9.4	0.810	0.4	0.4	240.589
	<b>Total</b>							<b>3.4</b>		<b>2304.76</b>

### • Refrigerator

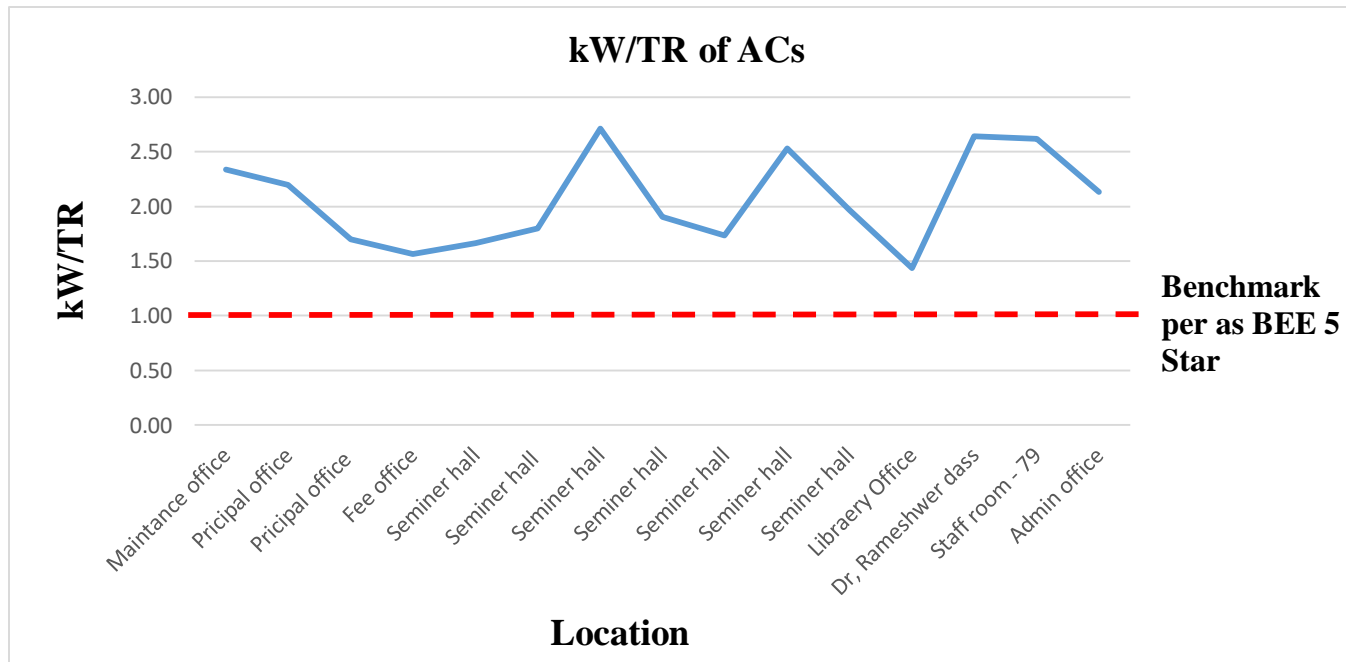
S. No.	Equipment Name	Voltage	THDv %	Hz	Current	THDi %	P.F.	Measured Wattage	Measured kVA	kWh/year
1	Refrigerator – 1	221.8	3.8	49.96	0.8	7.3	0.613	0.1	0.2	227.11
2	Refrigerator – 2	221.5	4.0	50.00	0.9	9.6	0.709	0.1	0.2	295.12
3	Refrigerator - 3	222.3	3.9	49.99	1.1	7.6	0.643	0.2	0.2	328.30
4	Refrigerator - 4	221.5	3.8	49.96	0.9	7.4	0.712	0.1	0.2	296.36
5	Refrigerator - 5	221.7	3.7	49.97	0.7	7.7	0.724	0.1	0.2	234.60
6	Refrigerator - 6	221.4	4.1	49.99	0.8	8.1	0.637	0.1	0.2	235.58
7	<b>Total</b>							<b>0.8</b>		<b>1617.078</b>

### • Air Condition System

S.N.	Location	Rated Tonnage	Measured kW	PF	Measured Tonnage	kW/TR	EER	Star Rating	kWh/Year
1	Maintenance office	1.5	1.73	0.85	0.74	2.34	1.51	Non star	2356.52
2	Principal office	1.5	1.88	0.83	0.86	2.20	1.60	Non star	2555.84
3	Principal office	1.5	1.46	0.97	0.86	1.70	2.07	3 star	1986.42
4	Fee office	1.5	1.29	0.99	0.83	1.56	2.25	5 star	1757.77
5	Seminar hall	1.5	1.58	0.93	0.95	1.66	2.11	Non star	2148.87
6	Seminar hall	1.5	1.58	0.99	0.88	1.80	1.96	Non star	2145.99
7	Seminar hall	1.5	2.13	0.95	0.79	2.71	1.30	Non star	2894.03
8	Seminar hall	1.5	1.89	0.99	0.99	1.91	1.84	Non star	2568.45
9	Seminar hall	1.5	1.72	0.78	0.99	1.73	2.03	Non star	2334.21
10	Seminar hall	1.5	2.05	0.91	0.81	2.53	1.39	Non star	2792.42
11	Seminar hall	1.5	1.79	0.81	0.91	1.97	1.79	Non star	2439.5



12	Library Office	1.5	1.22	0.90	0.85	1.43	2.45	Non star	1655.65
13	Dr, Rameshwar dass	1.5	1.11	0.73	0.42	2.64	1.33	2 star	1506.95
14	Staff room - 79	1.5	1.22	0.91	0.47	2.62	1.34	3 star	1662.88
15	Admin office	1.5	1.12	0.92	0.52	2.13	1.65	5 star	1516.66
	<b>Total</b>		<b>23.77</b>						<b>32322.2</b>

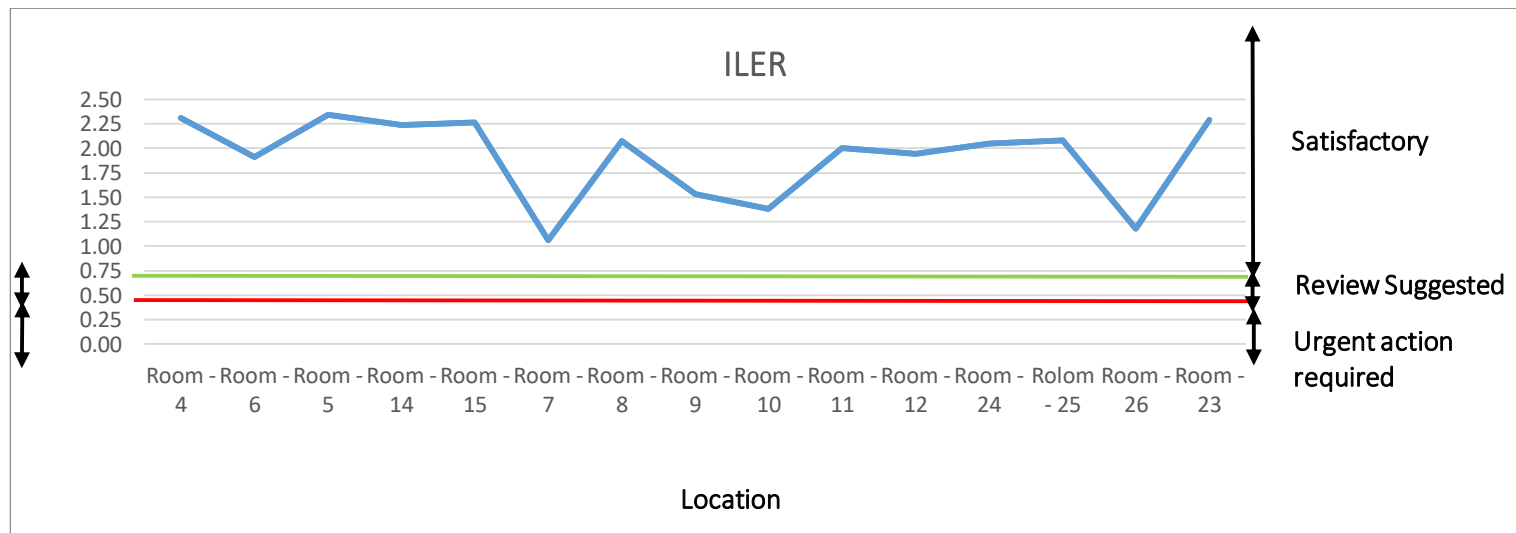


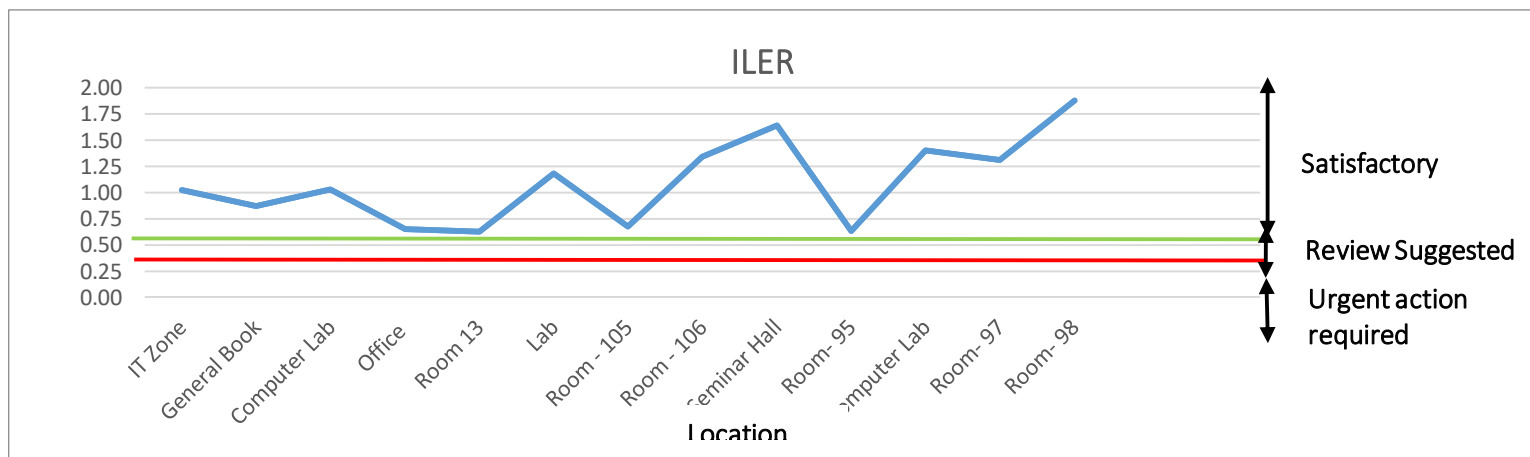
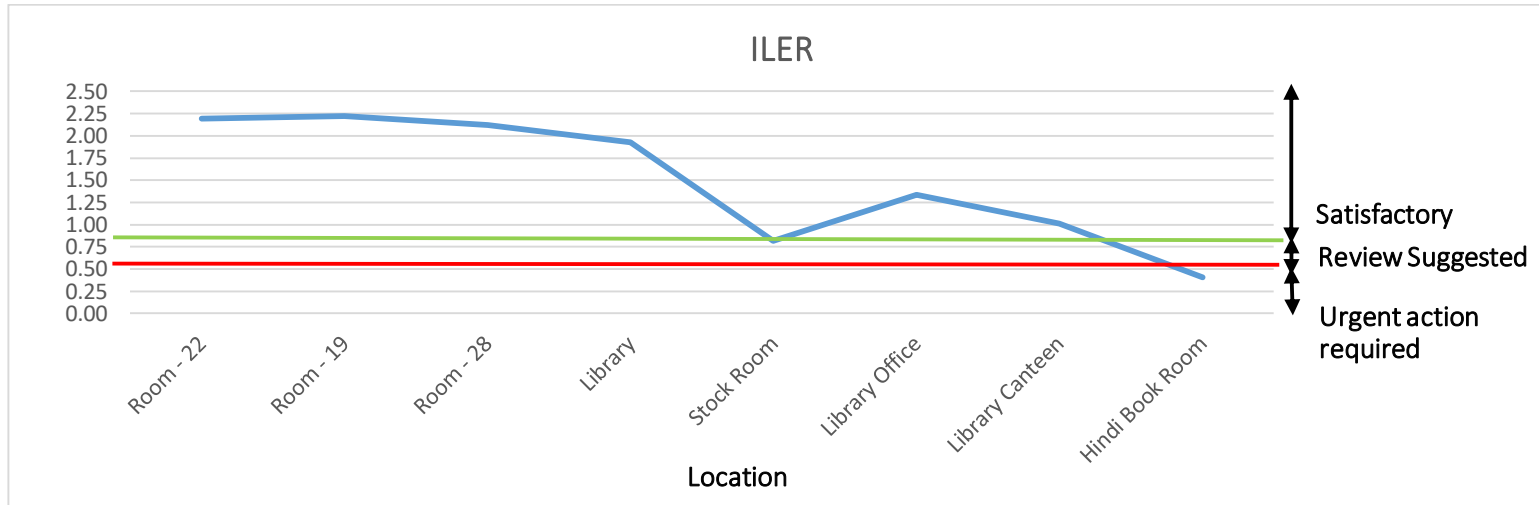
- **Lighting System**

- **Commerce Block**

S. No.	Location	No. of Luminaries	Wattage	Avg. Lux	Lux/W /sq.m	ILER	kWh/year
1	Room - 4	Led (18W*2)	36	208.0	83.05	2.31	75.17
2	Room - 6	T.B (36W*3)	108	218.0	82.15	1.91	225.50
3	Room - 5	Led (18W*2), T.B (36W*1)	72	155.0	100.71	2.34	150.34
4	Room - 14	Led (18W*4)	72	160.0	96.19	2.24	150.34
5	Room -15	Led (18W*3), T.B (36W*1)	90	184.0	97.21	2.26	187.92
6	Room - 7	T.B (36W*4)	144	101.0	45.78	1.06	300.67
7	Room - 8	Led (18W*4)	72	188.0	83.07	2.08	150.34
8	Room - 9	Led (18W*2), T.B (36W*2)	108	110.0	65.98	1.53	225.50
9	Room - 10	Led (18W*3), T.B (36W*1)	126	115.0	59.49	1.38	263.09
10	Room - 11	Led (18W*1), T.B (36W*3)	126	158.0	91.97	2.00	263.09
11	Room - 12	Led (18W*3), T.B (36W*1)	90	152.0	83.70	1.95	187.92
12	Room - 24	T.B (36W*3)	108	197.0	81.81	2.05	225.50
13	Rolom - 25	Led (18W*2), T.B (36W*2)	108	203.0	89.46	2.08	225.50
14	Room - 26	T.B (36W*3)	108	125.0	54.33	1.18	225.50
15	Room - 23	Led (18W*1), T.B (36W*2)	90	193.0	91.69	2.29	187.92
16	Room - 22	Led (18W*1), T.B (36W*2)	90	173.0	94.17	2.19	187.92
17	Room - 19	Led (18W*1), T.B (36W*1)	54	144.0	102.08	2.22	112.75
18	Room - 28	Led (18W*3), T.B (36W*1)	90	166.0	97.52	2.12	187.92
19	Library	Led (18W*24), T.B (36W*9)	756	658.0	92.50	1.93	1578.53
20	Stock Room	Led (18W*15), Halogen (100W*2)	470	296.0	37.45	0.81	981.36
21	Library Office	Led (36W*4)	144	519.0	48.00	1.33	300.67
22	Library Canteen	Led (18W*2), T.B (36W*3)	144	245.0	36.43	1.01	300.67
23	Hindi Book Room	T.B (36W*2)	72	145.0	14.66	0.41	150.34

24	IT Zone	Led (18W*2)	36	178.0	36.88	1.02	75.17
25	General Book	Led (18W*3)	54	215.0	31.35	0.87	112.75
26	Computer Lab	Led (18W*3), T.B (36W*7)	306	130.0	47.25	1.03	638.93
27	Office	Led (18W*4), T.B (36W*1)	108	242.0	23.47	0.65	225.50
28	Room 13	T.B (36W*6)	216	125.0	26.87	0.62	451.01
29	Lab	Led (18W*6), T.B (36W*5)	288	168.0	56.74	1.18	601.34
30	Room - 105	T.B (36W*2)	72	115.0	24.35	0.68	150.34
31	Room - 106	Led (18W*1), T.B (36W*3)	126	185.0	61.65	1.34	263.09
32	Seminar Hall	CFL (15W*18), LED (36W*8), Halogen (50W*2), CFL (36W*17)	1270	469.0	85.25	1.64	2651.76
33	Room- 95	Bulb (100W*1)	100	185.0	25.22	0.63	208.80
34	Computer Lab	Led (18W*6), T.B (36W*2)	180	165.0	64.47	1.40	375.84
35	Room- 97	Led (18W*1), T.B (36W*2), CFL (9W*1)	99	88.0	60.42	1.31	206.71
36	Room- 98	Led (18W*1), T.B (36W*2)	90	112.0	80.73	1.88	187.92
	<b>Total</b>		<b>6223</b>				<b>12993.62</b>



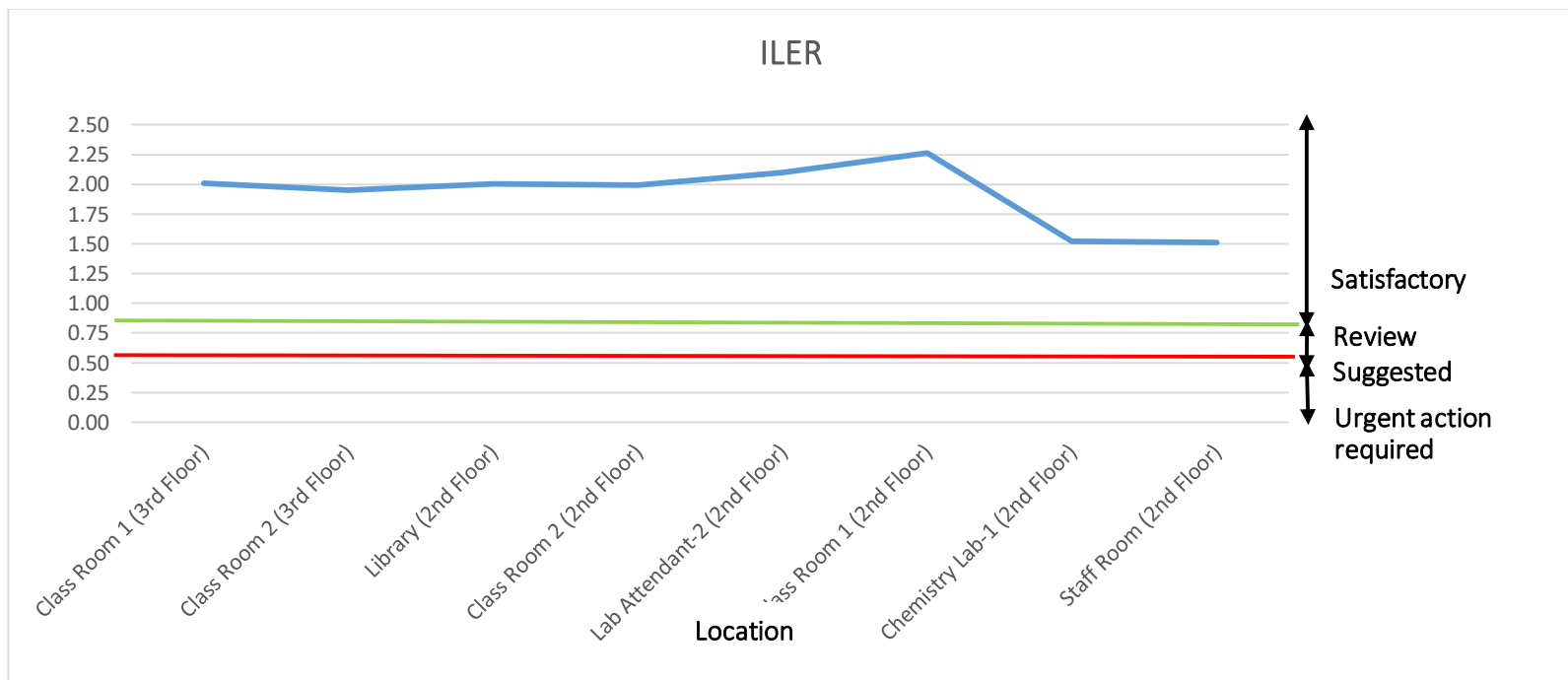
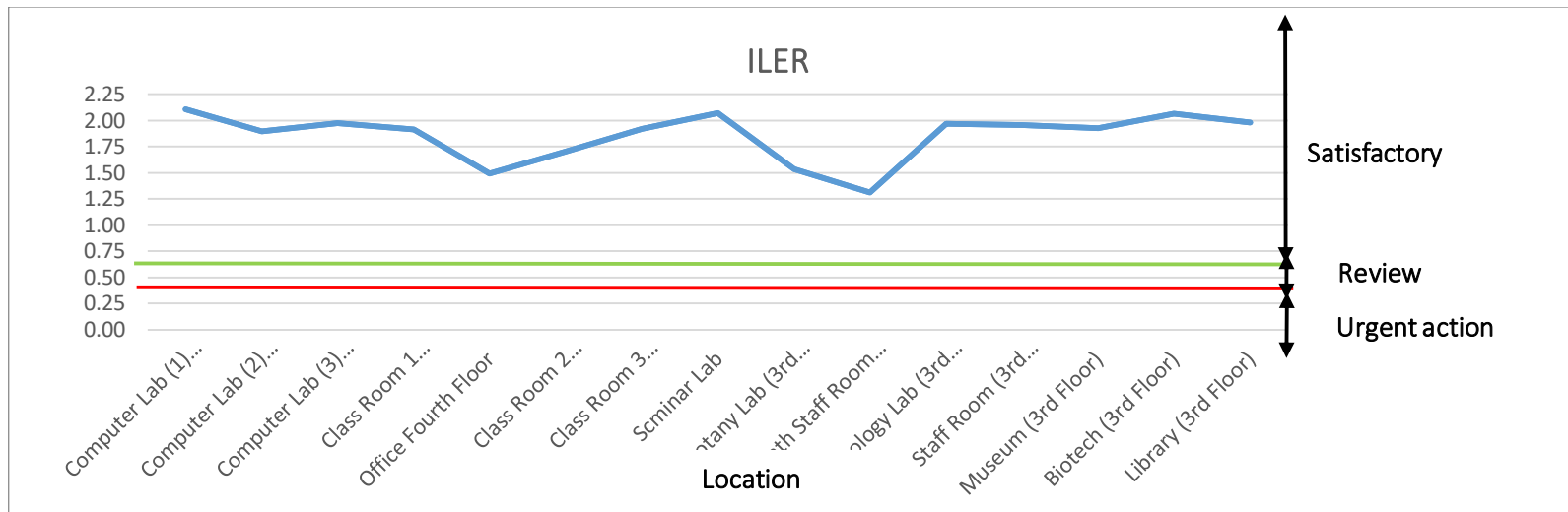


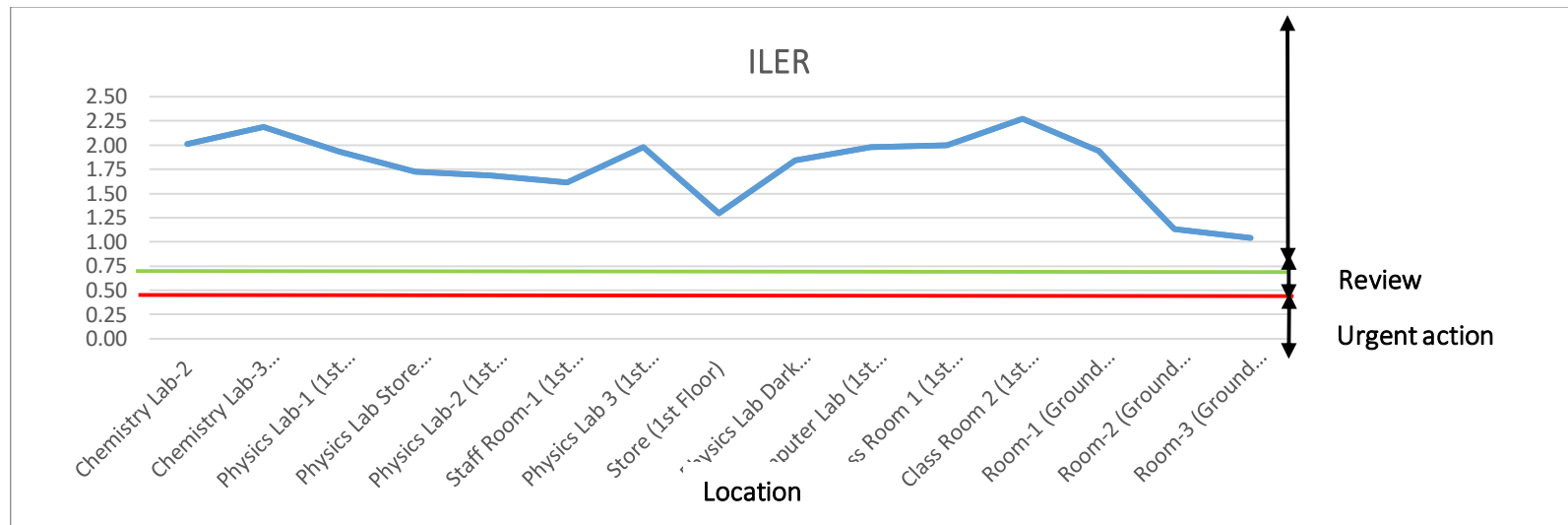
- Science Block

S. No.	Location	No. of Luminaries	Wattage	Avg. Lux	Lux/W/sq.m	ILER	kWh/Year
1	Computer Lab (1) Fourth Floor	Led (36W*4)	144	218.0	96.89	2.11	300.67
2	Computer Lab (2) Fourth Floor	Led (36W*4)	144	216.0	87.13	1.89	300.67
3	Computer Lab (3) Fourth Floor	Led (36W*4)	144	225.0	90.76	1.97	300.67
4	Class Room 1 Fourth Floor	Led (36W*4)	144	218.0	87.94	1.91	300.67
5	Office Fourth Floor	Led (36W*4)	144	234.0	64.15	1.49	300.67
6	Class Room 2 (Fourth Floor)	Led (36W*4)	144	268.0	73.13	1.70	300.67
7	Class Room 3 (Fourth Floor)	Led (36W*4)	144	297.0	82.65	1.92	300.67
8	Scminar Lab	Led (36W*8)	288	229.0	99.35	2.07	601.34
9	Botany Lab (3rd Floor)	Led (36W*10)	360	299.0	73.72	1.54	751.68
10	Math Staff Room (3rd Floor)	Led (36W*2)	72	199.0	47.26	1.31	150.34
11	Zoology Lab (3rd Floor)	Led (36W*5)	180	205.0	94.31	1.96	375.84
12	Staff Room (3rd Floor)	Led (36W*4)	144	311.0	84.02	1.95	300.67
13	Museum (3rd Floor)	Led (36W*4)	144	223.0	88.54	1.92	300.67
14	Biotech (3rd Floor)	Led (36W*6)	216	245.0	99.03	2.06	451.01
15	Library (3rd Floor)	Led (36W*4)	144	228.0	91.00	1.98	300.67
16	Class Room 1 (3rd Floor)	Led (36W*4)	144	231.0	92.42	2.01	300.67
17	Class Room 2 (3rd Floor)	Led (36W*4)	144	246.0	89.63	1.95	300.67
18	Library (2nd Floor)	Led (36W*4)	144	272.0	92.17	2.00	300.67
19	Class Room 2 (2nd Floor)	Led (36W*4)	144	209.0	91.70	1.99	300.67
20	Lab Attendant-2 (2nd Floor)	Led (36W*3)	108	248.0	100.85	2.10	225.50
21	Class Room 1 (2nd Floor)	Led (36W*4)	144	257.0	104.09	2.26	300.67
22	Chemistry Lab-1 (2nd Floor)	Led (36W*10)	360	297.0	72.93	1.52	751.68
23	Staff Room (2nd Floor)	Led (36W*5)	180	269.0	69.36	1.51	375.84
24	Chemistry Lab-2	Led (36W*8)	288	279.0	100.64	2.01	601.34



25	Chemistry Lab-3 (2nd Floor)	Led (36W*6)	216	249.0	105.14	2.19	451.01
26	Physics Lab-1 (1st Floor)	Led (36W*6)	216	225.0	92.82	1.93	451.01
27	Physics Lab Store (1st Floor)	Led (36W*2)	72	311.0	62.20	1.73	150.34
28	Physics Lab-2 (1st Floor)	Led (36W*2)	288	263.0	81.04	1.69	601.34
29	Staff Room-1 (1st Floor)	Led (36W*4)	144	325.0	64.65	1.62	300.67
30	Physics Lab 3 (1st Floor)	Led (36W*4)	144	193.0	94.90	1.98	300.67
31	Store (1st Floor)	Led (36W*3)	108	252.0	51.89	1.30	225.50
32	Physics Lab Dark Room (1st Floor)	Led (36W*4)	144	316.0	79.20	1.84	300.67
33	Computer Lab (1st Floor)	Led (36W*4)	144	282.0	85.21	1.98	300.67
34	Class Room 1 (1st Floor)	Led (36W*4)	144	215.0	91.91	2.00	300.67
35	Class Room 2 (1st Floor)	Led (36W*4)	144	238.0	104.42	2.27	300.67
36	Room-1 (Ground Floor)	Led (15W*21)	315	347.0	92.96	1.94	657.72
37	Room-2 (Ground Floor)	Led (15W*24)	360	267.0	52.19	1.13	751.68
38	Room-3 (Ground Floor)	Led (15W*27)	405	272.0	47.84	1.04	845.64
39	Store (Ground Floor)	Led (15W*4)	60	249.0	75.61	1.89	125.28
40	Room-4 (Ground Floor)	Led (15W*6)	90	205.0	69.28	1.61	187.92
41	Room-5 (Ground Floor)	Led (15W*10)	150	245.0	93.45	2.03	313.20
42	Room-6 (Ground Floor)	Led (15W*20)	300	264.0	90.07	1.88	626.40
	<b>Total</b>		<b>7656</b>				<b>15986.33</b>

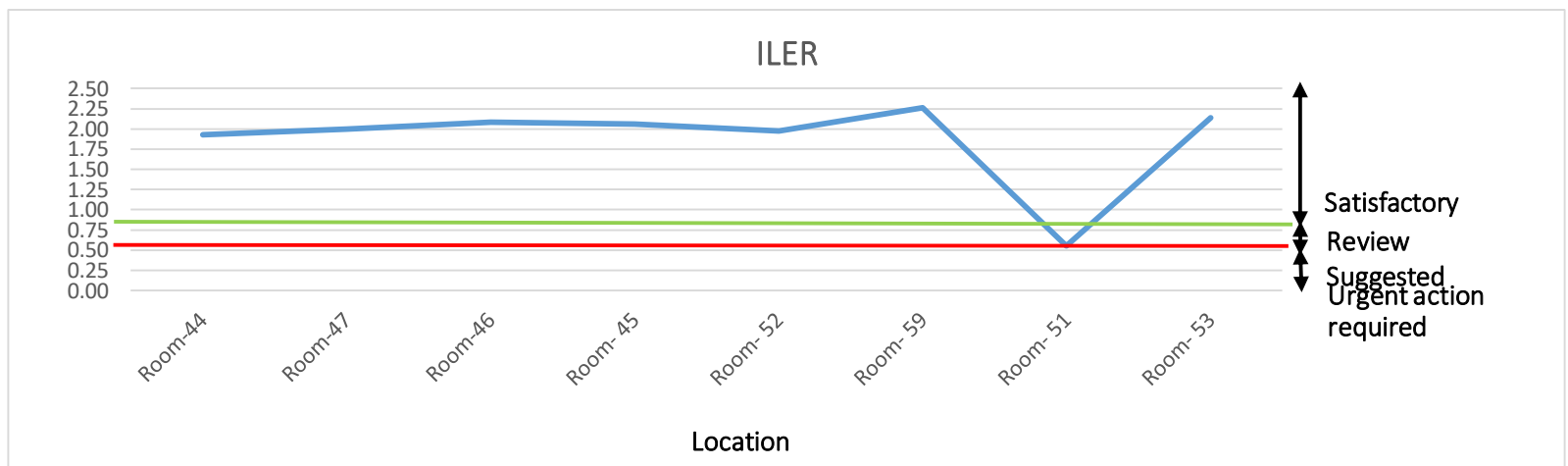
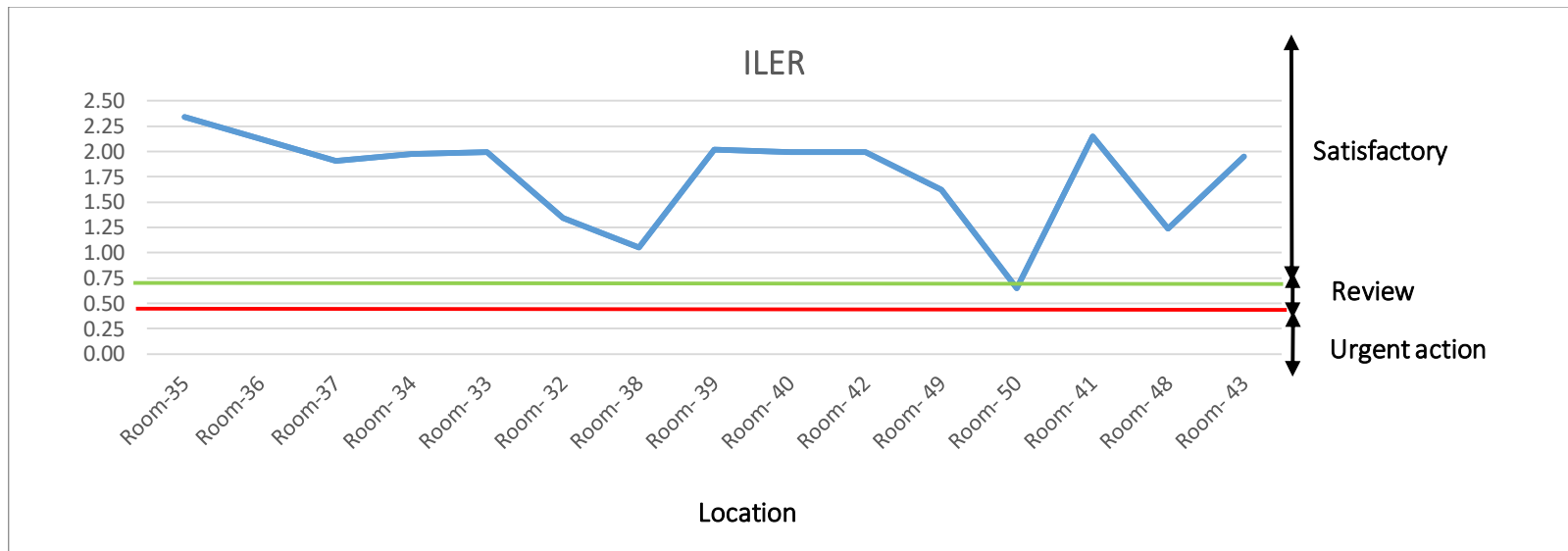




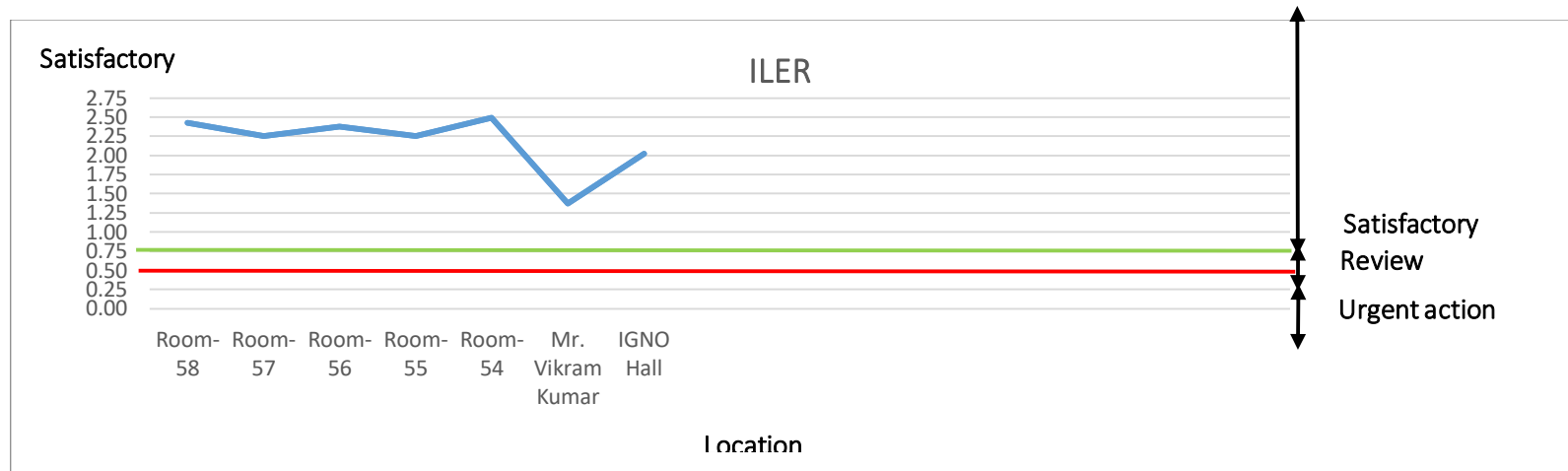
• **Arts Block**

S. No.	Location	No. of Luminaries	Wattage	Avg. Lux	Lux/W/sq.m	ILER	kWh/Year
1	Room-35	Led (18W*4)	72	195.0	107.68	2.34	152.64
2	Room-36	Led (18W*3), T.B (36W*1)	90	164.0	97.61	2.12	190.80
3	Room-37	Led (18W*3), T.B (36W*1)	90	147.0	87.60	1.90	190.80
4	Room- 34	Led (18W*4)	72	154.0	85.02	1.98	152.64
5	Room- 33	Led (18W*1), T.B (36W*1)	54	158.0	79.73	1.99	114.48
6	Room- 32	T.B (36W*2)	72	188.0	48.33	1.34	152.64
7	Room- 38	Led (18W*1), T.B (36W*2)	90	105.0	45.21	1.05	190.80
8	Room- 39	Led (18W*2)	36	152.0	72.73	2.02	76.32
9	Room- 40	Led (18W*2), CFL (9W*1)	45	214.0	71.83	2.00	95.40
10	Room- 42	Led (18W*3), T.B (36W*1)	90	185.0	79.67	1.99	190.80
11	Room- 49	CFL (18W*3)	54	101.0	64.86	1.62	114.48

12	Room- 50	Bulb (100W*1), T.B (36W*1)	136	210.0	23.26	0.65	288.32
13	Room- 41	Led (18W*2)	36	138.0	77.46	2.15	76.32
14	Room- 48	Bulb (100W*1), LED (18W*3)	154	240.0	49.48	1.24	326.48
15	Room- 43	Led (18W*3)	54	142.0	78.07	1.95	114.48
16	Room-44	Led (18W*4)	72	163.0	88.78	1.93	152.64
17	Room-47	Led (18W*4)	72	173.0	85.87	2.00	152.64
18	Room-46	Led (18W*3), T.B (36W*1)	90	167.0	95.71	2.08	190.80
19	Room- 45	Led (18W*4)	72	187.0	88.72	2.06	152.64
20	Room- 52	Led (18W*3)	54	164.0	79.12	1.98	114.48
21	Room- 59	Led (18W*3)	54	154.0	90.46	2.26	114.48
22	Room- 51	Bulb (100W*1), T.B (36W*1)	136	168.0	20.03	0.56	288.32
23	Room- 53	Led (18W*3)	54	185.0	85.61	2.14	114.48
24	Room- 58	Led (18W*3)	54	155.0	111.60	2.43	112.75
25	Room- 57	Led (18W*3)	54	173.0	89.96	2.25	112.75
26	Room- 56	Led (18W*3)	54	183.0	95.06	2.38	112.75
27	Room- 55	Led (18W*3)	54	175.0	90.22	2.26	112.75
28	Room- 54	Led (18W*3)	54	152.0	99.59	2.49	112.75
29	Mr. Vikram Kumar	Led (18W*2), T.B (36W*1)	72	207.0	49.34	1.37	150.34
30	IGNO Hall	Led (18W*8), Halogen (50W*2)	244	195.0	96.90	2.02	509.47
	<b>Total</b>		<b>2335</b>				<b>4931.45</b>



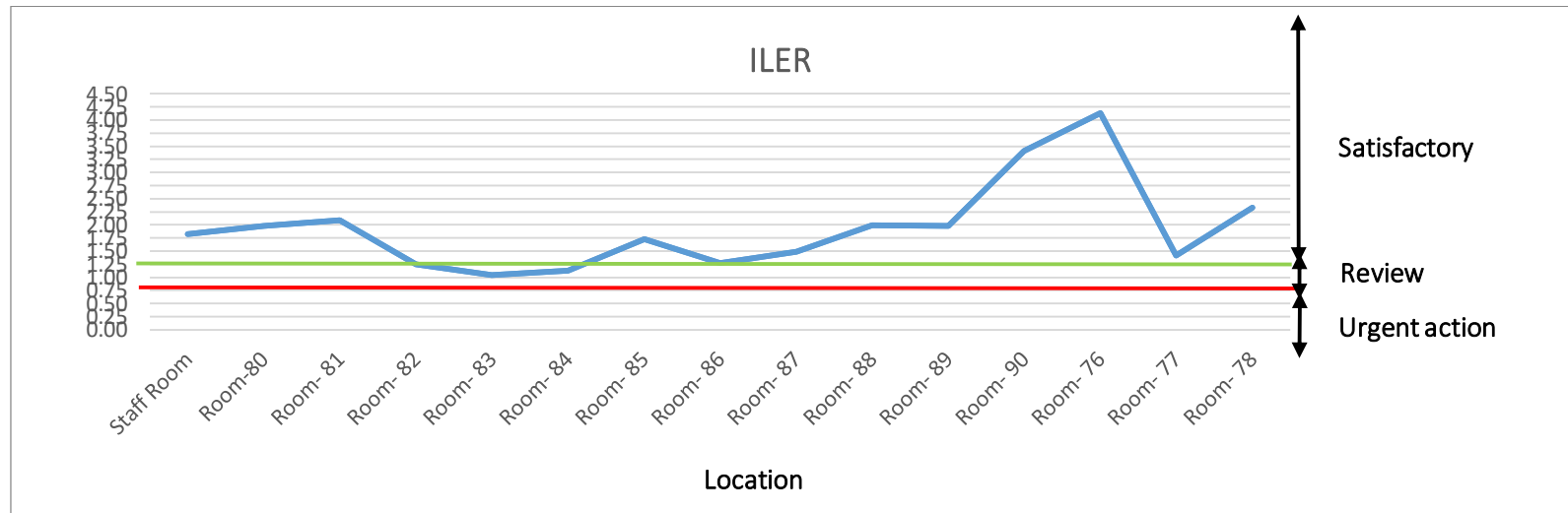




• **Girls Wing Block**

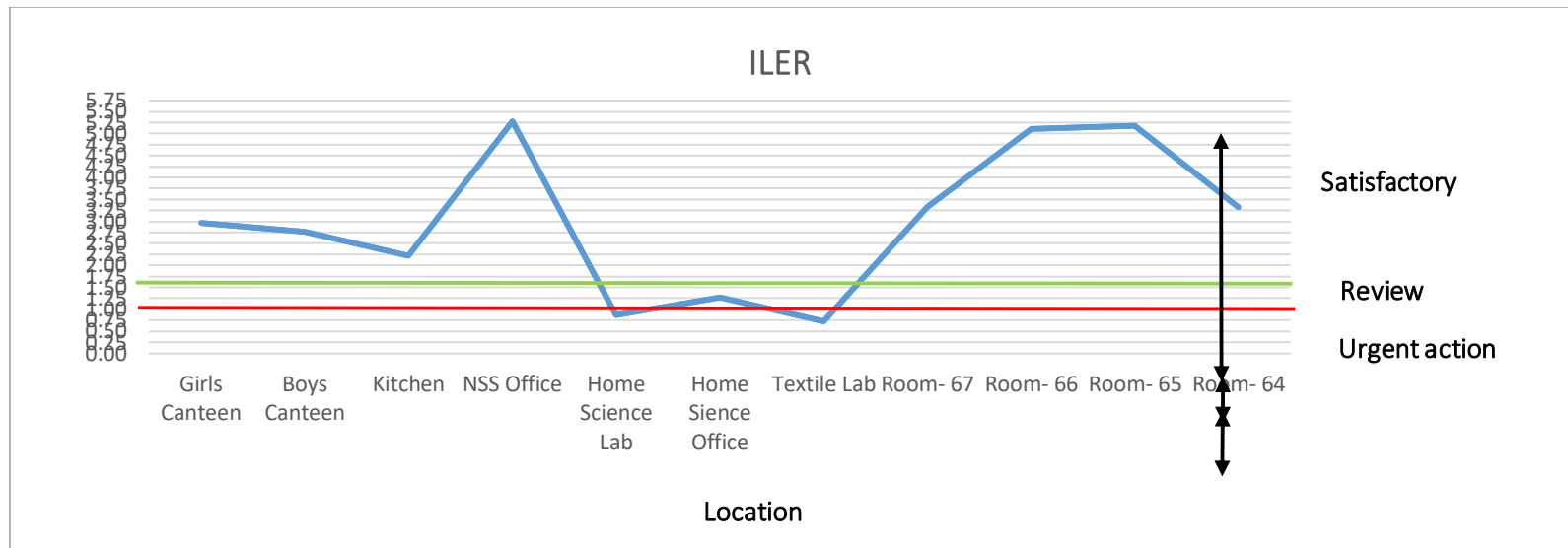
S. No.	Location	No. of Luminaries	Wattage	Avg. Lux	Lux/W/sq.m	ILER	kWh/Year
1	Staff Room	Led (36W*3), LED (18W*1), LED.B (9W*1)	135	248.0	73.07	1.83	281.88
2	Room-80	Led (18W*1)	18	133.0	71.39	1.98	37.58
3	Room- 81	Led (18W*1)	18	182.0	75.23	2.09	37.58
4	Room- 82	Led (36W*3)	108	165.0	49.74	1.24	225.50
5	Room- 83	Led (36W*4)	144	185.0	41.66	1.04	300.67
6	Room- 84	Led (36W*4)	144	180.0	40.76	1.13	300.67
7	Room- 85	Led (18W*3), T.B (36W*4)	198	239.0	79.50	1.73	413.42
8	Room- 86	Led (18W*3), LED (36W*4)	198	175.0	58.21	1.27	413.42
9	Room- 87	Led (18W*3), LED (36W*4)	198	205.0	68.19	1.48	413.42
10	Room- 88	Led (36W*4)	144	206.0	91.90	2.00	300.67
11	Room- 89	Led (18W*3), T.B (36W*4)	198	274.0	91.14	1.98	413.42
12	Room- 90	Led (18W*3), LED (36W*1)	90	214.0	156.60	3.40	187.92

13	Room- 76	Led (18W*2)	36	215.0	177.73	4.13	75.17
14	Room- 77	Led (18W*3), T.B (36W*6)	270	260.0	60.65	1.41	563.76
15	Room- 78	Led (18W*5), T.B (36W*1)	126	173.0	107.11	2.33	263.09
	<b>Total</b>		<b>2025</b>				<b>4228.20</b>



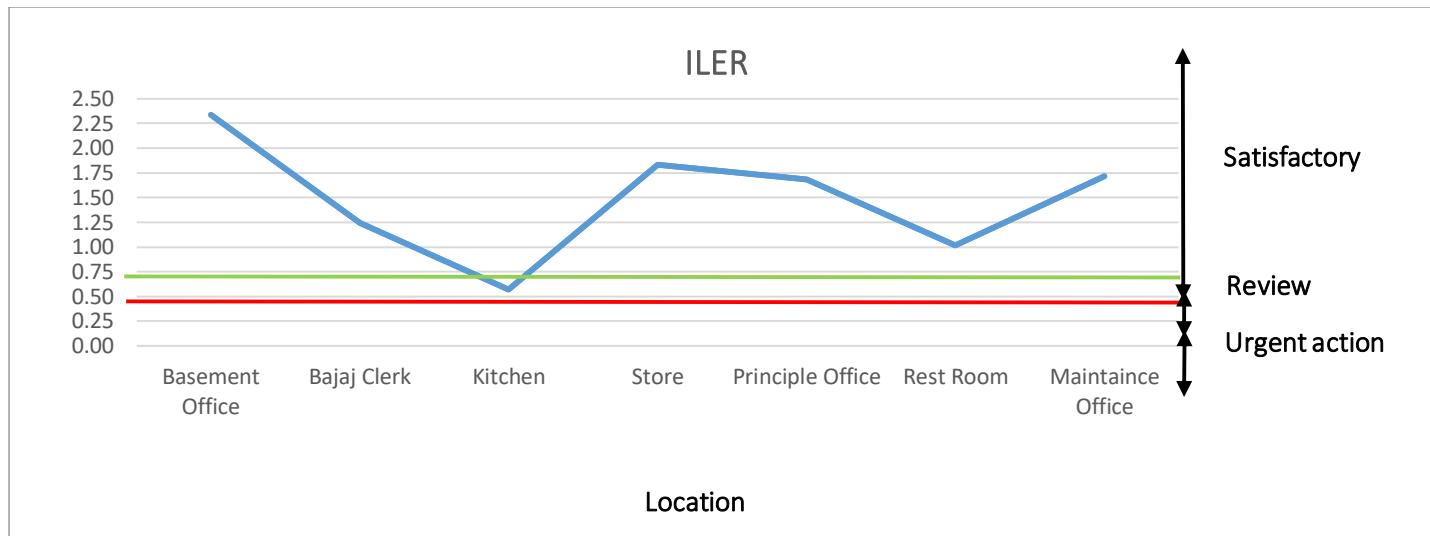
- **BBA, BCA, Canteen Block**

S. No.	Location	No. of Luminaries	Wattage	Avg. Lux	Lux/W/sq.m	ILER	kWh/Year
1	Girls Canteen	Led (18W*5)	90	120.0	142.60	2.97	187.92
2	Boys Canteen	Led (18W*6)	108	136.0	132.94	2.77	225.50
3	Kitchen	Led (18W*1), T.B (36W*1)	54	182.0	88.93	2.22	112.75
4	NSS Office	Led (18W*2), LED.B (9W*1)	45	233.0	227.25	5.28	93.96
5	Home Science Lab	T.B (36W*4), LED (18W*6), CFL (9W*1)	261	143.0	40.29	0.88	544.97
6	Home Sience Office	Led (18W*2)	36	191.0	45.84	1.27	75.17
7	Textile Lab	Led (18W*9), T.B (36W*9)	486	265.0	33.65	0.73	1014.77
8	Room- 67	Led (18W*3)	54	167.0	143.29	3.33	112.75
9	Room- 66	Led (18W*3)	54	265.0	204.18	5.10	112.75
10	Room- 65	Led (18W*3)	54	275.0	207.32	5.18	112.75
11	Room- 64	Led (18W*3)	54	170.0	132.85	3.32	112.75
	<b>Total</b>		<b>1296</b>				<b>2706.05</b>



• **Principal Office**

S. No.	Location	No. of Luminaries	Wattage	Avg. Lux	Lux/W/sq.m	ILER	kWh/year
1	Basement Office	Led (18W*5), T.B (36W*1)	126	162.0	100.44	2.34	263.09
2	Bajaj Clerk	Led (18W*2)	36	190.0	44.67	1.24	75.17
3	Kitchen	T.B (36W*2)	72	175.0	20.57	0.57	150.34
4	Store	Led (18W*1), LED.B (9W*1)	27	185.0	66.04	1.83	56.38
5	Principle Office	Led (18W*6)	108	186.0	72.33	1.68	225.50
6	Rest Room	Led (18W*2), LED (15W*2), LED.B (9W*1)	75	225.0	36.69	1.02	156.60
7	Maintenance Office	Led (18W*2), T.B (36W*1)	72	230.0	61.84	1.72	150.34
	<b>Total</b>		<b>516</b>				<b>1077.41</b>





A. Water Audit				
S.N.	Item	Value		
1	What are the different sources of water supply to the building?	Ground Water		
	Municipal Supply/ Ground Water/ Tanker			
2	Is there a raw water treatment plant on site?	Yes/ NO	NO	
3	Is there a wastewater treatment plant on site?	Yes/ NO	NO	
4	Provide water quality test reports for portable and treated water specifying the following parameters			
	Parameter	Acceptable limit	Drinking Water	Treated/ recycled water
	Total hardness (as CaCO <sub>3</sub> ) (mg/litre)	200	248	
	Total dissolved solids (mg/litre)	Max. 100	412	
	Chlorides as chlorine (mg/litre)	250	63.98	
	Colour (hazen)	5		
	Turbidity (NTU)	1		
	Alkalinity (mg/l)	200	196	
	Calcium (as Ca), mg/litre	20-75	51.3	
	Boron (mg/litre)	<2	Not available	
	Sulphates (as SO <sub>4</sub> ) (mg/litre)		46.2	
	Nitrates (as NO <sub>3</sub> ) (mg/litre)		12.6	
	Conductivity at 25 °C (uS/cm)	<300	Not available	
	pH	6.5-8.5	7.2	
	Anionic (mg/litre) detergents as MBAS		Not available	
	Arsenic (mg/litre)		Not available	
	Iron (mg/litre)	1	Not available	
	Fluorides (mg/litre)		0.65	
	Cyanide (mg/litre)	Absent	Absent	
	Chromium (mg/litre)	Absent	Absent	
	Total Coli forms (CFU/100ml)	Absent	Absent	
Escherichia coli (CGU/100ml)	Absent	Absent		
Chemical Oxygen Demand (COD) (mg/L)	4.5			
Biochemical Oxygen Demand (BOD) (mg/L)	Max. 30			
Oil & Grease (mg/L)	0			
Total Suspended Solids (TSS) (mg/L)	Max. 100			
Total Coliform Bacteria (MPN/100ml)	<2 to 1600			

## Test Report of Drinking Water



### HARYANA TEST HOUSE

**& Consultancy Services**  
GOVT. RECOGNISED LABORATORY

50-C, Sector-25 Part-II, HUDA, PANIPAT-132 103 (HR.)  
 Contact : (Off) 86077-70160, 0180-3510205 (Env.) 86077-70164, (BM) 86077-70166, (Food) 86077-70169  
 Web Site : www.haryanatesthouse.net, e-mail : haryanatesthouseca@gmail.com, info@haryanatesthouse.net



DOC No. HTHQF/7.8

TC-7811

Recognition / Approval : MoEF / FSSAI / BIS / ISO 9001, 14001, 45001 Certified Lab.

<b>Issued To:</b> PRINCIPAL IB COLLEGE Panipat (HR)	<b>Report No. :</b> HTH/WT/220311004 <b>ULR No. :</b> TC781122200000597F <b>Party's Ref No. :</b> Nil <b>Booking Date :</b> 11/03/2022 <b>Period of Testing :</b> 11/03/2022 To 17/03/2022 <b>Reporting Date :</b> 17/03/2022
---	--

<b>Sample Description</b> : Drinking Water Sample Type of Industry : Educational College Date of sampling : NS Date of receipt of sample : 11/03/2022 Environmental Condition : Not Specified Sampling Reference Protocol : Not Specified	<b>Sample Name</b> : Drinking Water Sample Sample quantity : 2 Ltr. + 250 ml in sterilized bottle Sample Location : Not Specified Purpose of analysis : Monitoring Sampling Done by : Sample supplied by party
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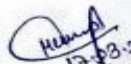
REFERENCE TO PROTOCOL : IS 10500:2012 (Amend 3, Feb 2021)


TEST RESULTS						
S.N.	Parameter's	Unit's	Results	Acceptable Limit's	Permissible Limit's	Method of Analysis
<b>Discipline - Chemical , Group -Water</b>						
<b>Organoleptic and Physical Parameter's</b>						
1	pH	-	7.2	6.5-8.5	No Relaxation	IS 3025 (P-11)-1983
2	Total Dissolved Solids (TDS)	mg/l	412.0	500 Max.	2000 Max.	IS 3025 (P-16)-1984
<b>General parameters Concerning Substances undesirable in excessive amounts</b>						
1	Total Hardness (as CaCO <sub>3</sub> )	mg/l	248.0	200 Max.	600 Max.	IS 3025 (P-21)2009
2	Calcium (as Ca)	mg/l	51.3	75.0	200.0	IS 3025 (P-40)1991
3	Magnesium (as Mg)	mg/l	29.22	30.0	100.0	IS 3025 (P-46)1994
4	Chloride (as Cl)	mg/l	63.98	250 Max.	3000 Max.	IS 3025 (P-32)1988
5	Sulphate (as SO <sub>4</sub> )	mg/l	46.2	200 Max.	400 Max.	IS 3025 (P-24)1986
6	Nitrate (as NO <sub>3</sub> )	mg/l	11.60	45.0	No Relaxation	IS 3025 (P-34)2021
7	Fluoride (as F)	mg/l	0.65	1.0	1.5	APHA-4500 F-
8	Total Alkalinity (as CaCO <sub>3</sub> )	mg/l	196.0	200 Max.	600 Max.	IS 3025 (P-23)1986
<b>Discipline - Biological , Group - Water</b>						
1	Coliform	Per 100 ml	Absent	Shall Not be Detectable	No Relaxation	IS:15185:2016
2	E.coli	Per 100 ml	Absent	Shall Not be Detectable	No Relaxation	IS:15185:2016

\*\*\*End of Report\*\*\*

Remarks : Analysed parameters of water sample confirms to IS 10500:2012 specification with respect to permissible limits for the above test parameters

*Manu*  
Review by 17.3.22

  
 Manendra Kumar  
 Sr. Microbiologist (Biological)

  
 ML Sharma  
 Dy. Manager (ENV.)

Page No.: 1 of 1

Note : 1. This report is not to be reproduced wholly or in part and cannot be used as an evidence in the court of law.  
 2. This report should not be used in any advertising media without our special permission in writing.  
 3. Sample will be destroyed after 7 days for Perishable items & 30 days for non-perishable items from the date of issue of test report.  
 4. The results are related to the test items only.

Rain Water Harvesting structures inside the campus

The College campus have three pits of Rain Harvesting for Water conservation.



Solid Waste Audit			
S.N.	Item		
1	Total quantity of waste generated (kg/day)		8 KG
2	Are multi-coloured bins provided for waste segregation at source?	Yes/NO	Yes
3	Is there a provision of space for hygienic storage of segregated waste?	Yes/NO	Yes
4	If answered 'yes' for '3', please provided details for the storage space for the following type of waste:		
	1. Biodegradable	Yes- 13' x 13' x 4'	
	2. Recyclable	Lab - 23' x 23'	
	3. Inert and miscellaneous	10' x 8' x 3'	
	4. Hazardous	NA	
5	Quantity of waste generated (Kg) This data should be collected for at least 2 representative days in a week.		
		Type of waste (Kg)	
a.	Biodegradable	3 Kg	
b.	Recyclable	2 Kg	
c.	Inert and miscellaneous	3 Kg	
d.	Hazardous	NA	
6	Is there a treatment plant for biodegradable waste?	Yes/NO	Yes
7	If answered 'yes' for '6' then provide the following details		
	1. Type of plant	Vermicompost Plant	
	2. Capacity	13' x 13' x 4'	
8	Provide a narrative (max. 250 words) on how each type of waste generated by the building is being weighed and disposed. Also specify procedure adopted for e-waste disposal	<p>Type of Solid Waste generated: -</p> <p>Inside the campus, solid wastes are generated in the form of glass, polythene, thermacol, paper, food waste (peels of fruits &amp; vegetables, left portion of food). These are segregated into a set of 3 dustbins.</p> <p>Dustbins sets: -            Yellow - Only Paper            Blue - Food waste - peels of fruits &amp; vegetables, left portion of food.            Red - Glass, polythene, thermacol</p> <p>Weight of waste generated per day: -            Glass - 200 gm.            inert - 3kg.            Polybags and poly cover - 1.5 kg.            Thermacol - 1.3 kg.            Paper - 2 kg.            Eatables - 1 kg. Biodegradable &amp; Recyclable - 5 kg.            Leaves of plants - 2 kg.            (Varies according to season)</p> <p><b>Disposal of Waste:-</b>            Polyethene's , glass &amp; thermacol are picked up by workers of Nagar Nigam, Panipat.</p>	



		<p>Paper waste is recycled and converted into paper pulp which is used to make different useful products (paper mould –Art) – sent to nearby paper plants          Peels of fruits &amp; vegetables are used to make bio enzyme. This bio enzyme is used as a fertilizer. Different types of bio enzymes are prepared like orange bio enzyme, banana, mango, lemon.          Food waste &amp; tree leaves are used for Vermi- Composting plant. Fertilizes or compost made after decay &amp; decomposition of food waste is used as a fertilizer for garden plants from the College campus.          E-waste generated from the College:-          1. Computer parts          2. CCTV Cameras          3. Battery          4. Generator part          5. UPS, Power Cables, Printers</p> <p>All the E-Waste generated from the College are collected at one place and at the end of the year it is sold to “Exigo-E-Waste plant”, Samalkha. In this plant all the e-waste is recycled accordingly by taking into consideration the importance of environmental protection. It is environment tally sate disposal method of e-waste management by the company. For this certificate is provided to a College by the company.</p>
--	--	---

**Provisions of space for Segregated waste at Laboratory building**



## 6

## 6. RESULTS AND CONCLUSION

The total energy consumption as per the EB bill, Transformer recording, DG generation and all utility consumption are as below:

- Electricity consumption as per EB (Mar 21-Feb 22) = 96612 kWh/year
- DG power generation (21-22) = 11308.8 kWh/year
- All utility consumption (during audit) = 96193 kWh/year

The decreased power consumption of transformer during audit when compared to the all-utility consumption was due to non-operation of utilities during recording. Therefore, energy consumption as per EB bill and as per all utilities has been taken into consideration for EPI analysis.


$$\text{Energy Performance Index, EPI (kWh/annum/m}^2\text{)} = \frac{\text{Total Energy consumption } \left(\frac{\text{kWh}}{\text{year}}\right)}{\text{Total builtup area (m}^2\text{)}}$$

Particulars	EPI (kWh/annum/m <sup>2</sup> )
As per EB bill + DG	= (96612 + 11308.8)/4488
	= 24 kWh/annum/m <sup>2</sup>
As per utility consumption during audit + DG	= (96193 + 11308.8)/4488
	= 24 kWh/annum/m <sup>2</sup>



**ANNEXURES**

**Calibration Certificate**



# ALISHA INSTRUMENTS

**NABL MINISTRY OF SCIENCE & TECHNOLOGY APPROVED LAB.**  
Calibration & Repair of all Process Control & Measuring Instruments

E-mail : alishainstruments@rediffmail.com, alishainstruments@gmail.com, gagan\_calibration@hotmail.com  
Abmn.Office : HL 327, Phase-2, S.A.S. Nagar, Mohali-160 055(Pb.)  
Mobile : 98722-07327, 92164-00327


## CALIBRATION CERTIFICATE


<b>Certificate Number :</b> 9540209/21-22/(12)		Page : 1 of 2
<b>Calibrated For</b>	PGS ENERGY SERVICES .PVT.LTD SCO-409 & 410, SECTOR-35 C, CHANDIGARH	
<b>Calibrated on</b>	30-09-2021	
<b>Next Calibration Due</b>	30-09-2022	

Description of Sample			
<b>Nomenclature</b>	POWER ANALYSER THREE PHASE	<b>Model</b>	ALM-36
<b>Range</b>	R.T.R	<b>Make</b>	KRYKARD
<b>Resolution</b>	ASSORTED	<b>S.No</b>	4565/123761RCH
<b>Zero Error</b>	Nil	<b>Party I/D Mark No.</b>	PA-002
<b>Environmental Condition</b>	Temperature = 23 +/- 5 ° C Humidity = 50 +/- 10 %	<b>Test Purpos</b>	AMPERE MEASUREMENT
<b>calibration Performed At</b>	AT LAB	<b>Reference Standard</b>	IS-1248
		<b>Location</b>	

Master Equipment / Standard Used					
S.No	Nomenclature	Make	Calibrated By	Certificate No.	Due Date of Cai
1	MULTIMETER 6.5 DIG.	FLUKE	ANSHAANKAN (INDIA)	CC202020000000729F	18-12-2022
2	UNIVERSAL CALIB	RADIX	ANSHAANKAN (INDIA)	CC202020000000731F	18-12-2022
3	MULTIFUNCTION	FLUKE	ANSHAANKAN (INDIA)	AIPL/2020/0733	14-12-2022

RESULTS					
S.No	STD	UUC	STD	UUC	
01	45.00 Hz	45.0 Hz	50.00 V	50.0 V	
02	55.00 Hz	55.2 Hz	250.00 V	250.2 V	
03	65.00 Hz	65.2 Hz	500.00 V	500.5 V	
01	20.00 A	20.0 A	800.00 V	800.5 V	
02	40.00 A	40.2 A	2500 Kva	2500 Kva	
03	60.00 A	60.3 A	5000 Kva	5001 Kva	
04	100.00 A	100.5 A	7500 Kva	7501 Kva	
01	2500 Kw	2501 Kw	9500 Kva	9502 Kva	
02	5000 Kw	5001 Kw			
03	7500 Kw	7501 Kw			
04	9500 Kw	9502 Kw			



Approved By   
Name **Gagandeep Singh**  
Designation **Quality / Tech. Manager**

Condition : 1. The calibration certificate issued by our laboratory refers only to the particular item submitted for calibration.  
2. The calibration result reported in this certificate are valid at the time of and under the stated conditions of measurement.  
3. This particular certificates can not be reproduced except in full, without prior permission of chief executive officer of the lab.  
4. While Alisha Instruments had made their best endeavors to provide accurate and reliable information, Alisha Instruments is not responsible for any financial liability arising from any act. of omission or error made.

**CALIBRATION TEST CERTIFICATE**

CUSTOMER NAME: M/s. PGS Energy Service Pvt Ltd.,  
DOC CODE: AEPL/CAL/076

Date: 11-Oct-2021

**1. DEVICE UNDER CALIBRATION**

MODEL : ALM 10  
SERIAL NO : 102268  
WARANTY NO : 116601 JBH  
CT MODEL : 140mm Ampflex CT

**2. TEST CONDITION**

TEMPERATURE : 24°C  
RELATIVE HUMIDITY : 48%

**3. METHOD USED**

COMPARISON  
ABSOLUTE

RESULT: COMPARISON

**4. TOLERANCE**

WITHIN TOLERANCE  
OUT OF TOLERANCE

RESULT: WITHIN TOLERANCE

Detailed Calibration Report Attached

**5. REFERENCES:**

CALIBRATION VERIFIED WITH REF. TO POWER MONITOR  
MAKE : ENERDIS ,MODEL: ENERIUM 200 (Sl. No. 119457 KCH)

Annual Traceability to NABL Certificate No. M-210309-4-1  
Dated 09-03-2021 to 09-03-2022, Due Before 09-03-2022

**6. NEXT CALIBRATION DUE ON :**

Date: 10-Oct-2023

CALIBRATED BY,

Page 1





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Abmn.Office : HL 327, Phase-2, S.A.S. Nagar, Mohali-160 055(Pb.)  
Mobile : 98722-07327, 92164-00327

## CALIBRATION CERTIFICATE

Certificate Number :	9540211/21-22/(12)	Page : 1 of 1
Calibrated For	PGS ENERGY SERVICES PVT.LTD SCO-408 & 410, SECTOR-35 C, CHANDIGARH	
Calibrated on	30-09-2021	
Next Calibration Due	30-09-2022	

Description of Sample			
Nomenclature	LUX METER	Calibration Procedure	ALS/AM/488
Range	0-200000 LUX	Make	KUSUM MECO
Resolution	1& 10 LUX	Instrument i.d	LM-004
Zero Error	Nil	Serial Number	
Environmental Cond.	Temperature = 23 ± 2 ° C Humidity = 40 +/- 60 %	Test Purpos	LUX MEASEUREMENTS
calibration Performed	ON SITE	Reference Standard	IS-1248
		Model	KM-200K

Master Equipment / Standard Used					
S.No	Nomenclature	Make	Calibrated By	Certificate No.	Due Date of Cal
1	DIGITAL LUX METER	LEJTRON	TECHNO MEASURE PVT.LTD JAIPUR	TMPL/21/210626 201 2	26-09-2023

### RESULTS

reading in LUX

S.No	STD READING	UUC				
01	20.00	20.00				
02	200.00	200.00				
03	2000	2001				
04	20000	20002				
05	40000	40002				
06	50000	50002				
07	100000	100002				
08	200000	200004				




Approved By  
Name  
Designation

Gagandeep Singh  
Quality / Tech. Manager

- Condition : 1. The calibration certificate issue by our laboratory refers only to the particular item submitted for calibration.  
2. The calibration result reported in this certificate are valid at the time of and under the stated conditions of measurement.  
3. This particular certificates can not be reproduced except in full, without prior permission of chief executive officer of the lab.  
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Abmn.Office : HL 327, Phase-2, S.A.S. Nagar, Mohali-160 055(Pb.)  
Mobile : 98722-07327, 92164-00327

## CALIBRATION CERTIFICATE

Certificate Number : 9540213/21-22/(12)		Page : 1 of 1				
Calibrated For	PGS ENERGY SERVICES PVT.LTD SCO-409 & 410, SECTOR-35 C, CHANDIGARH					
Calibrated on	30-09-2021					
Next Calibration Due	30-09-2022					
Description of Sample						
Nomenclature	DIGITAL ANEMOMETER	Location	TESTO			
Range	0.6 TO 40 m / sec	Make	TESTO			
Resolution	0.1 m/sec	Model Num				
Zero Error	Nil	Party I/D Mark No.	AM-009			
Environmental Condition	Temperature = 23 +/- 2 ° C Humidity = 40 +/- 60 %	Test Purpose	TEMP & HUMIDITY MEASUREMENT			
calibration Performed At	AT LAB	Reference Standard	IS:1348			
		Serial Number	03068651			
Master Equipment / Standard Used						
S.No	Nomenclature	Make	Calibrated By	Certificate No.	Due Date of Cal	
1	DIG ANEMOMETER	MEXTECH	TECHNO MEASURE	TMP/L210626 201.1	26-09-2023	
RESULTS						
Reading in m/sec						
SR	NU	STD READING	UUC			
01		1.0		1.0		
02		5.0		5.0		
03		10.0		10.0		
04		20.0		20.0		
05		30.0		30.2		
06		40.0		40.2		



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Abmn.Office : HL 327, Phase-2, S.A.S. Nagar, Mohali-160 055(Pb.)  
Mobile : 98722-07327, 92164-00327

## CALIBRATION CERTIFICATE

Certificate Number :	9540205/21-22(112)	Page : 1 of 1
Calibrated For	PGS ENERGY SERVICES (PVT.) LTD SCO-409 & 410, SECTOR-35 C, CHANDIGARH	
Calibrated on	30-09-2021	
Next Calibration Due	30-09-2022	

Description of Sample			
Nomenclature	DIGITAL THERMO HYGRO METER	Location	TESTO
Range	0 TO 60 DEG CEL & 30-90 % RH	Make	TESTO
Resolution	0.1 DEG CEL & 0.1 % RH	Model Num	
Zero Error	Nil	Party I/D Mark No.	THM-009
Environmental Condition	Temperature = 23 +/- 5 °C	Test Purpos	TEMP & HUMIDITY MEASUREMENT
calibration Performed At	Humidity = 50 +/- 10 %	Reference Standard	IS:1248
	AT LAB	Serial Number	63531868

Master Equipment / Standard Used					
S.No	Nomenclature	Make	Calibrated By	Certificate No.	Due Date of Cal
1	DIG HYGROMETER	TEMPTEC	PARASHAR MICRO MEASUREMENT	PMM/20-7820	18-07-2021
2	MULTIMETER 6.5 DIG	FLUKE	ANISHAANKAN (INDIA)	CC202019000000909F	25-10-2021

### RESULTS

Reading in DEG CEL					
SR	NU	STD READING	LUUC	STD	LUUC
TEMPERATURE IN DEG CEL					
1.00		30.0	30.0	30.0	30.0
2.00		35.0	35.0	40.0	40.0
3.00		40.1	41.0	40.0	41.0
4.00		45.1	46.0	40.0	41.0
5.00		49.1	48.0	50.0	52.0

Approved By   
Name Gagandeep Singh  
Designation Quality / Tech. Manager



Condition : 1. The calibration certificate issue by our laboratory refers only to the particular item submitted for calibration.  
2. The calibration result reported in this certificate are valid at the time of and under the stated conditions of measurement.  
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