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# **D.V.V. CLARIFICATION**

## **Criterion No. 7**

### **Metric No. 7.1.6**

#### **(1) Supporting Documents**

# **1. Green Audit**

Govt. College Khertha, Distt.- Balod (C.G.)

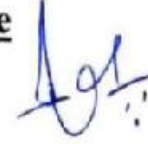
**GREEN AUDIT REPORT**  
**2020-2021**



**Member Of Green Audit Committee**

Shri Umesh kumar Pathak

Assistant Professor



Miss Yamini Sahu  
(M.Sc. Botany)

Assistant Professor



Smt. Devprabha Sahu  
(M.Sc. Botany)

Lab Technician




**External Expert – Green Audit Committee**

Dr. Dharmendra Singh

Assistant Professor,  
Department of Commerce, Govt. N.C.J.  
College Dallirajhara.




  
**Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)**

## Introduction:-

The term "Green" means eco-friendly or not damaging the environment. This can acronymically is called as "Global Readiness in Ensuring Ecological Neutrality" (GREEN). Green accounting can be defined as systematic identification quantification, recording, reporting & analysis of components of ecological diversity & expressing the same in financial or social terms. "Green Auditing", an umbrella term, is known by another name "Environmental Auditing". There is a provision of green audit in college campus. A committee has been formed to monitor the proper conservation and plantation of the plants in the campus. As per the suggestions made by IQAC, botany department is given the responsibility to do green audit with cooperation of the environmental experts of the state. A report on green audit has been prepared by department of botany Govt. College Khertha Distt.- Balod (C.G.). This college was established in 2008. Total area of the college main campus is **9.78** acres, of which 30 percent is covered by herbs, shrubs and trees. The plants have been systematically identified by the green audit committee. There are more than **48** plant species were audited. The green audit report has been discussed with environmental experts. Extra efforts have been taken by the college to create environment consciousness amongst students. One major step in this regard is the extensive plantation program organized by NSS, UG students of botany and Teaching Staff. Plantation is encouraged by principal and faculties of all departments to increase greenery and reduce carbon emission effects. Renovation of the garden at the entrance was done with financial support from Jan Bhagidari Samiti. Extension programs also organized to create environment awareness and conservation of biodiversity amongst the students and public.



  
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**Activities organized to create greenery and its conservation at college campus is as follows-**

- Plantation of diversified species
- Uses of medicinal plants
- Identification of plants species

### **Plantation of diversified species:**

To create- green cover, eco-friendly atmosphere, pure oxygen at the college campus, plantation program is organized every year with involving all students, principal, and all departments faculty members. In this session van mahotsav program was organized and about 100 ornamental, avenue, medicinal plant with rare and exotic beautiful trees was planted in botanical garden and other parts of college campus. To keep the greeneries in the campus, we regularly maintain the gardens which are looked after by paid staff under the guidance of garden committee members. Moreover, every year we try to plant new trees. Seasonal flower garden is also a unique feature of this college.


### **Uses of medicinal plants:**

There are many medicinal plants are planted in college botanical garden. The plants have medicinal value but students don't have knowledge how to use and they can't identify the particular plants, so therefore faculty members of botany department help them to identify with scientific name and give information about medicinal uses of the plants.

### **Identification of plant species:**

There are so many plant species are present at college campus. The faculty member of the botany department audited and identified of various plant species with the help of flora.




  
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## List of the Audited Plants

| S.No. | Scientific Name of Plant  | Local Name                | Family          | Nos |
|-------|---------------------------|---------------------------|-----------------|-----|
| 1.    | Polyanthia longifolia     | Ashok                     | Annonaceae      | 10  |
| 2.    | Azadiracta indica         | Neem                      | Meliaceae       | 16  |
| 3.    | Zizyphus jujube           | Ber                       | Rhamnaceae      | 7   |
| 4.    | Cocos nucifera            | Narial                    | Palmaceae       | 1   |
| 5.    | Dalbergia sissoo          | Sheesham                  | Papilionaceae   | 17  |
| 6.    | Delonix regia             | Gulmohar                  | Caesalpiniaceae | 5   |
| 7.    | Emblica officinalis       | Amala                     | Euphorbiaceae   | 1   |
| 8.    | Ficus bengalensis         | Bargad                    | Moraceae        | 2   |
| 9.    | Leucaena leucocephala     | Shubabul                  | Mimosaceae      | 1   |
| 10.   | Mangifera indica          | Aam                       | Anacardiaceae   | 4   |
| 11.   | Moringa oleifera          | Munaga                    | Moringaceae     | 3   |
| 12.   | Pongamia pinnata          | Karanj                    | Papilionaceae   | 13  |
| 13.   | Syzygium cuminii          | Jamun                     | Myrtaceae       | 6   |
| 14.   | Pithecolobium dulce       | Ganga Emli                | Mimosaceae      | 1   |
| 15.   | Citrus limon              | Nibu                      | Rulaceae        | 2   |
| 16.   | Punica granatum           | Anar                      | Punicaceae      | 1   |
| 17.   | Citrus Sinensis           | Orange                    | Rutaceae        | 1   |
| 18.   | Psidium guajava           | Amrud (Guava)             | Myrtaceae       | 12  |
| 19.   | Artocarpus hulero phyllus | Jack fruit                | Moraceae        | 2   |
| 20.   | Annona squamosa           | Custard fruit (Sita phal) | Annonaceae      | 4   |
| 21.   | Vachellia nilotica        | Babul                     | Fabaceae        | 40  |
| 22.   | Manilkara zapota          | Chiku                     | Sapotaceae      | 2   |
| 23.   | Gmelina arborea           | Khamhar                   | Lamiaceae       | 1   |



  
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|     |                        |               |               |   |
|-----|------------------------|---------------|---------------|---|
| 24. | Jatropha curcas        | Ratanjot      | Euphorbiaceae | 1 |
| 25. | Morus alba             | Shahtut       | Moraceae      | 1 |
| 26. | Bauhinia variegata     | Kachnar       | Fabceae       | 1 |
| 27. | Butea monosperma       | Palas (Parsa) | Fabceae       | 4 |
| 28. | Terminalia arjuna      | Arjun tree    | Combretaceae  | 4 |
| 29. | Aegle marmelos         | Bael          | Rutaceae      | 1 |
| 30. | Anacardium occidentale | Kaaju         | Anacardiaceae | 3 |
| 31. | Ficus religiosa        | Pipal         | Moraceae      | 2 |
| 32. | Hibiscus rosa sinensis | Gulhar        | Malvaceae     | 1 |
| 33. | Callistemon            | Bottlebrush   | Myrtaceae     | 2 |
| 34. | Bixa orellana          | Sinduri       | Bixaceae      | 1 |
| 35. | Cordia dichotoma       | Bohar         | Boraginaceae  | 1 |
| 36. | Musa acuminata         | Banana(Kela)  | Mosaceae      | 1 |

### Medicinal Plants

| S.No. | Scientific Name of Plant | Local Name    | Family         | Nos |
|-------|--------------------------|---------------|----------------|-----|
| 1.    | Aloe vera                | Ghee Kwar     | Liliaceae      | 1   |
| 2.    | Catharanthes roseus      | Sada Suhagan  | Apocynaceae    | 2   |
| 3.    | Tinospora cordifolia     | Giloey        | Menispermaceae | 1   |
| 4.    | Kalanchoe pirmata        | Pattharchatta | Crassuaceae    | 5   |
| 5.    | Mentha piperita          | Mint          | Lamiaceae      |     |
| 6.    | Ocimum tenuiflorum       | Tulsi         | Lamiaceae      | 1   |
| 7.    | Murraya koenigii         | Meetha neem   | Rutaceae       | 1   |
| 8.    | Calotropis gigantea      | Fudahar       | Apocynaceae    |     |
| 9.    | Eclipta prostrata        | Bhringraj     | Asteraceae     |     |
| 10.   | Cassia tora              | Charota       | Fabaceae       |     |
| 11.   | Solanum virginianum      | Nili cateri   | Solanaceae     |     |
| 12.   | Phyllanthus niruri       | Bhui amla     | Phyllanthaceae |     |



  
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***Polyanthia longifolia* (Ashok)**



***Psidium guajava* (Amrud)**



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**Artocarpus hulero phyllus**



**Emblica officinalis(Amala)**



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**Zizyphus jujube (Ber)**



**Morus alba (Shahtut)**



*Dinesh*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)



**Citrus Sinensis (Orang)**



**Mangifera indica (Aam)**



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**Callistemon**



**Kalanchoe pinnatifida (Patthachitta)**



*Dinesh*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)



**Ficus bengalensis(Bargad)**



**Syzygium cuminii (Jamun)**



*Dennis*  
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**Catharanthus roseus (Sadasuhagan)**



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OFFICE OF THE PRINCIPAL  
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<http://www.govtcollegekhertha.in>

**CIRCULAR FOR MAINTENANCE OF GREEN CAMPUS**

In view of the recommendations by green Audit committee in the Internal green Audit Report of College, the college has decided to implement several policy decisions for the upkeep and maintenance of greenery inside the college premises. The point-wise initiatives for maintenance of green campus are as follows:

- Landscaping of college premises with trees and plants through regular plantation of saplings.
- Plantation of saplings of medicinal importance and air purifying properties.
- Formation of Green Army – a group of students dedicated towards clean and green campus initiatives.
- Establishment of Green Zone, Oxy Zone, Plastic-free Zone inside the college campus.
- Display of messages for environment protection, water conservation and saving trees.
- Use of Plastic bags and other use & throw plastic items to be banned inside the college premises.
- outside traffic shall be completely restricted inside the college campus while the vehicles of outsiders / visitors to be allowed conditionally and occasionally.
- Speed of more than 10 km /h for vehicles playing inside the college campus shall not be entertained.
- Students and staff to be encouraged for use of bicycles, Zero/ low emission vehicles and public transport.


**Green campus committee:**

- Dr. Sudha Soni** - Convener  
**Mr. Umesh Pathak** - Coordinator  
**Smt. Sudha Sharma** - Member  
**Smt. Devprabha sahu** - Member

  
Principal

Govt College , Khertha  
Distt. Balod (C.G.)



  
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Govt. College, Khertha  
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## **Suggestion for Future Development of Green & Clean Campus**

1. Improve the greenery up to 50% by plantation like trees and medicinal plants in the campus.
2. Plantation of water harvesting plants.
3. Eco-friendly management.
4. Development of medicinal garden.
5. Organic farming for the support of nature and environment.
6. Development of pollution free zone
7. Awareness about cleanliness and maintenance of flora and fauna.



*Principi*  
**Principal,  
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## 2. Energy Audit

**ENERGY AUDIT REPORT**  
**OF**  
**GOVT. COLLEGE KHERTHA, BALOD,**  
**CHHATTISGARH**



**ADDRESS: - KHERTHA BAZAR ROAD, KHERTHA, CHHATTISGARH**  
**KHERTHA, BALOD (C.G.)-491771**

**Prepared By -**



**AUDITTECH**

**Audittech Industrial Services Private Limited**

**Opps. Mahavir Bhawan, Tikrapara, Balod, Chhattisgarh-491226**

**Contact- 9827143100/9407702444**

**Email- [info@audittech.co.in](mailto:info@audittech.co.in) Website- [www.audittech.co.in](http://www.audittech.co.in)**

**AUGUST-2021**

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## ACKNOWLEDGEMENT

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We express our sincere gratitude to **M/s. Govt. College Khertha, Balod** for giving us the opportunity to be a part of their mission towards Energy Conservation.

We are thankful to all officers and employees of **M/s. Govt. College Khertha, Balod** with whom we interacted during the field study for their whole hearted support in undertaking measurements and eagerness to assess the system/equipment efficiencies and saving potential. The willingness of these key personnel to participate in this program and acknowledge the call for energy efficiency is more than half the issues received.



Signature:

**Date: AUG 2021**

**Mr. Aashish Bafna, Director**

**Place: Raipur**

**Certified Energy Auditor**

## Energy Auditor Certificate

Reg No.: EA-28916



Certificate No.: 9780/19

# National Productivity Council

(National Certifying Agency)

## PROVISIONAL CERTIFICATE

This is to certify that Mr./Mrs./Ms. **AASHISH BAFNA**  
son / daughter of Mr. **ASHOK BAFNA** has passed the National certification Examination for Energy Auditors held in September 2018, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as **Certified Energy Manager** as well as **Certified Energy Auditor**.

He / She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for Accredited Energy Auditor and issuance of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the Bureau of Energy Efficiency issues an official certificate.

Digitally Signed by K V R RAJU  
Mon Apr 22 16:23:39 IST 2019  
Controller of Examination, NPC AIP Chennai

Place : Chennai, India

Date : 22nd April, 2019

  
Controller of Examination

1.

## **EXECUTIVE SUMMARY**

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An Energy Audit is a study of a Plant or facility to do determine how & where energy is used and to identify methods for Energy Savings. There is now a Universal recognition of the fact that new Technologies and much greater use of some that already exist provide the most hopeful prospects for the future. The Opportunities lie in the use of existing Renewable Energy Technologies, greater efforts at Energy Efficiency and the dissemination of these Technologies and Options.

This report is just one step, a mere Mile Marker towards our destination of Achieving Energy Efficiency and we would like to emphasize that an Energy Audit is a Continuous Process. We have compiled a list of Possible actions to Conserve and Efficiently utilize our scarce Resources and identified their Savings Potential. The next step would be to prioritize their Implementation.

We look forward with Optimism that the College Authorities, staffs and students shall ensure the maximum execution of the recommendations and the success of this work.

### **Govt. College Khertha Facility**

Government college, Khertha affiliated to Hemchand Yadav Vishwavidyalaya comes under higher education department of Chhattisgarh government in district Balod. This college was established in the year 2008. This college was established to provide higher education to young and deserving students. Arts, science, commerce faculties are functioning in this College. The co-curricular and sports activities are organized to stimulate the creativity and to maintain physical fitness of the students. The units of National Service Scheme and Youth Red Cross Society create a sense of social responsibility among the students. Career counselling and coaching classes for entering into various services are also organized under the banner of Career guidance scheme.

### **Electrical power:**

The establishment has a dedicated 11 KV connection from Chhattisgarh state power distribution company Ltd. The facility also installed a Dedicated 25 KVA Transformer for College.

| SN | Energy saving measures  | Investment<br>Rs. Lakhs | Yearly energy savings |       |              |                   | Cost saving<br>/year<br>(Rs.Lakhs) | Payback<br>Period<br>(Year) |
|----|---|-------------------------|-----------------------|-------|--------------|-------------------|------------------------------------|-----------------------------|
|    |   |                         | Oil                   | Gas   | Coal<br>(MT) | Electricity (kWh) |                                    |                             |
| 1  | 2   | 3                       | 4                     | 5     | 6            | 7                 | 9                                  | 10                          |
| 1  | Replacement of Tube Light of 40W + 15 W(Choke) with Energy Efficient 20W LED Tube | 0.08                    | .....                 | ..... | .....        | 1837              | 0.143                              | 0.52                        |
| 2  | Replacement of Ceiling Fan of 80W With EESL Energy Efficient 35W BLDC Ceiling Fan | 3.00                    | .....                 | ..... | .....        | 11340             | 0.88                               | 3.39                        |
| 3  | Installation of 20 kW Solar Power Generation Unit in Roof Top                     | 10.00                   | .....                 | ..... | .....        | 30000             | 2.34                               | 4.20                        |
|    | <b>Total</b>  | <b>13.08</b>            | .....                 | ..... | .....        | <b>43177</b>      | <b>3.37</b>                        | <b>3.88</b>                 |

|  |              |                  |
|--|--------------|------------------|
| <b>Total implementation cost proposed</b>                | <b>13.08</b> | <b>Rs. Lakhs</b> |
| <b>Total Energy saving Potential identified (In kWh)</b> | <b>0.43</b>  | <b>Lakhs kWh</b> |
| <b>Total cost Saving Potential</b>                       | <b>3.37</b>  | <b>Rs. Lakhs</b> |
| <b>Simple Pay Back Period</b>                            | <b>3.88</b>  | <b>Yrs.</b>      |

Note: Consider Electricity unit rate- Rs. 7.80/kWh



## 1.1 Need for Energy Audit

In any Educational Institute, the three top operating expenses are often found to be Energy, Manpower, Operational Expenses. If one were to relate to the manageability of the cost or potential cost savings in each of the above components, Energy would invariably emerge as a Key Component, and thus Energy Management function constitutes a strategic area for cost reduction. Energy Audit will help to understand more about ways Energy and Fuel are used in any identity, and help in identifying the areas where waste occurs and where scope for improvement-exists.

The Energy Audit would give a Positive Orientation to the Energy cost reduction, preventive maintenance and quarterly Central Programmes which are vital for production and utility activities. Such an Audit Programme will help to keep focus on variations which occur in the Energy costs, availability and reliability of supply of Energy, decide on approximate Energy mix, identify Energy Conservation Technologies, retrofit for Energy Conservation Equipment etc.

In General, Energy Audit is the translation of conservative ideas into realities, by lending Technically feasible solutions with economic and other Organizational considerations within a specified time frame.

The Primary Objective of Energy Audit is to determine ways to reduce Energy Consumption per unit of Product Output or to lower Operating costs. Energy Audit provides a "Benchmark" for managing Energy in the Organization and also provides the basis for Planning a more effective use of Energy throughout the Organization.

## 1.2 Introduction

This Project is the vision to make Govt. College Khertha Energy Efficient. Govt. College Khertha campus Energy bill keeps up around **INR 0.70 Lakhs per year**. This amount is huge and thus naturally attracts attention when we understand that quite a lot of energy is being wasted, which in turn would mean that huge amount of Financial resources is being wasted.

Making the Campus Energy Efficient will not only help the College reduce its expenses but also helps us fulfil our moral responsibility of not wasting this precious resource, which is scarcely available to rest of the people of the country.

We are confident that the results that will come out of this exercise are bound to be of interest to everyone and can be the first step to make Govt. College khertha campus energetically the most efficient campus in India.

### 1.3 Energy Audit Objectives

**Primary: -**

- 1) The first objective is to acquire and analyze data and finding the necessary consumption pattern of these facilities.
- 2) The second objective will be to calculate the wastage pattern based on the results of the first objective.
- 3) The final objective is to find and implement solutions that are acceptable and feasible.

**Secondary: -**

- 1) This would be our first exposure to this field hence experience gain would be vital.
- 2) This project will precede many follow up projects and hence helps to gain technical and management exposure required for future energy projects.
- 3) It is sure to help create a repertoire of vital contacts hence will develop interaction with alumni, faculty and students.

### 1.4 Source of Energy

Govt. College Khertha uses Energy in Following Forms:

- a. Electricity from CSPDCL

The Following are the Major consumers of Electricity in the facility

- a. Lightning
- b. Fans
- c. Computers
- d. Other Lab Equipment

### 1.5 Indirect Benefits of Energy Audit

Every time the Energy Audit is carried out it rekindles the interest in Energy Conservation as an important function. Energy Auditors sharing their experience and knowledge with the Plant Personnel, helps in fuelling the innovative ideas for further action of reduction in Specific Power consumption (SPC). Any loose connections or heating of cables come to timely vision. For an external agency due to unbiased vision, a few points for Energy Conservation may be visible each time they perform the audit and this would help in achieving further saving. Inform any irregularities in Energy meter CT connections for rectification.

## 1.6 Introduction of Auditing Firm

**M/s. Audittech Industrial Services Private Limited** is an empanelled Accredited Energy Audit Firm from Bureau of Energy Efficiency, Ministry of Power, Government of India. It is one of the fast growing Energy Audit & Energy services providing company executed several projects covering all the energy Intensive Sectors & states of India. The directors and associate team members are very well experienced in the field of Energy Audit and executed more than 150 no's Detailed Energy Audit so far.

The associate team and expert are highly qualified and experienced in the field of Energy Audit and Services. Individual credential of each member in the field of Energy Audit is very rich due to their past association with very reputed organization of Energy Audit Services.

|                         |  |
|-------------------------|--|
| <b>Name of Firm:</b>    | <b>Audittech Industrial Services Private Limited</b>   |
| <b>Address:</b>         | <b>Opps. Mahavir Bhawan, Tikarapara, Balod, Chhattisgarh-491226</b>  |
| <b>Contact details:</b> | <b>9827143100 / 9407702444,<br/>Email id: <a href="mailto:info@audittech.co.in">info@audittech.co.in</a>, <a href="mailto:aispl.rpr@gmail.com">aispl.rpr@gmail.com</a></b> |

Company have Head office at Balod (C.G.) & Branch offices at Durg, Bhopal, Mumbai & Delhi.

### Directors Details

| <b>Sr. No.</b> | <b>Name</b>           | <b>Designation / Technical Experience</b> | <b>Technical Experience /Qualification</b>   |
|----------------|-----------------------|---|--|
| <b>1</b>       | Mr. Aashish Bafna     | Managing Director - 10yrs                 | B.E (E&I)., MBA(Energy Management), Certified Energy Auditor, Surveyor & Loss Assessor |
| <b>2</b>       | Mr. Rakesh Khichariya | Director- 25Yrs                           | B.E (Elect.), Accredited Energy Auditor  |
| <b>3</b>       | Mr. Ramesh Patel      | Director- 25Yrs                           | B.E.(Mtech), Govt Approved Valuer, Competent Person for Factory Act                    |
| <b>4</b>       | Mr. Isshant Chainani  | Director- 10 Yrs                          | B.E. (Elect & telecom)   |
| <b>5</b>       | Mrs. Shikha Golchha   | Director- 8 yrs                           | B.E., MBA (Finance)  |

### 1.7 Energy audit team

Following are the team involved in the Energy Audit of the Govt. College Khertha

| SN | Name                   | Designation/<br>Qualification        | Experience | Contact<br>Details |
|----|------------------------|--------------------------------------|------------|--------------------|
| 1  | Mr. Rakesh khichariya  | Accredited Energy Auditor (AEA-0295) | 25 yrs.    | 9827411444         |
| 2  | Mr. Aashish Bafna      | Certified Energy Auditor (EA-28916)  | 10 yrs.    | 9827143100         |
| 3  | Mr. Isshant Chainani   | Certified Energy Manager (EA-29062)  | 10 yrs.    | 9407702444         |
| 4  | Mr. Dhaleshwar Prasad  | Certified Energy Manager (EA-27299)  | 9 yrs.     | 9179294953         |
| 5  | Mr. Sumit Singh Thakur | Certified Energy Manager (EA-28549)  | 9 yrs.     | 8770632688         |
| 6  | Mr. Mahaveer Bafna     | Energy Engineer                      | 3 yrs      | 8962369293         |
| 7  | Mr. Tukeshwar Yadav    | Energy Engineer                      | 1 yrs      | 6260997416         |

### 1.8 List of Instruments

Following are the instrument used at the time of the Energy Audit.

| Sr.No. | Instrument  | Make/Sr.No.                  |
|--------|---|------------------------------|
| 1      | Power & Harmonics Analyser, 1 Set (With CT, PT) LT                    | Krykard ALM 31/<br>123673RCH |
| 2      | Power & Harmonics Analyser, 1 Set (With CT, PT) LT                    | Krykard ALM 20/ 28107280     |
| 3      | Ultrasonic Flow meter, 1 Set (With 3Sized Transducer & Pressure gauge | Chinese/ 28107280            |
| 4      | Lux Meter 1Set (Digital Lux Meter)                                    | MECO G<br>930P/201704004601  |

### 1.9 Methodology of Energy Audit

The purpose of the Audit was to ensure that the practices followed in the campus with the criteria, methods and recommendations used in the audit were based on the identified risks. The methodology includes: preparation and filling up of questionnaire, Physical inspection of the campus, observation and review of the document, interviewing responsible persons and data analysis, measurements and recommendations. The methodology adopted for this Audit was a three-step process comprising of:

1. **Data Collection** - In preliminary data collection phase, exhaustive data collection was performed using different tools such as observation, survey communicating with responsible persons and measurements. Following steps were taken for data collection:

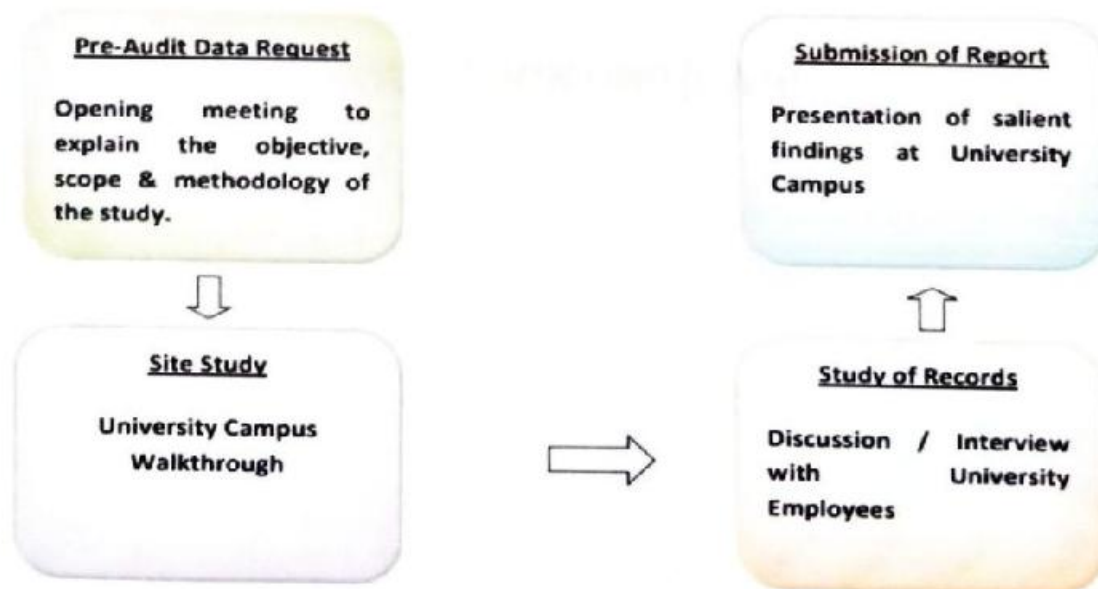
The team went to each department, centres, Library, canteen, Student Blocks, labs, etc.

Data about the general information was collected by observation and interview.

The power consumption of appliances was recorded by taking an average value in some cases.

2. **Data Analysis** - Detailed analysis of data collected include: calculation of energy consumption, analysis of latest electricity bill of the campus, understanding the tariff plan provided by the. Chhattisgarh State Power Distribution Company (CSPDCL). Data related to water usages were also analysed using appropriate methodology.

3. **Recommendation /Suggestions** - On the basis of results of data analysis and observations, some steps for reducing power and water consumption were recommended. Proper treatments for waste were also suggested. Use of fossil fuels has to be reduced for the sake of community health.



**AUDIT FLOW CHART**

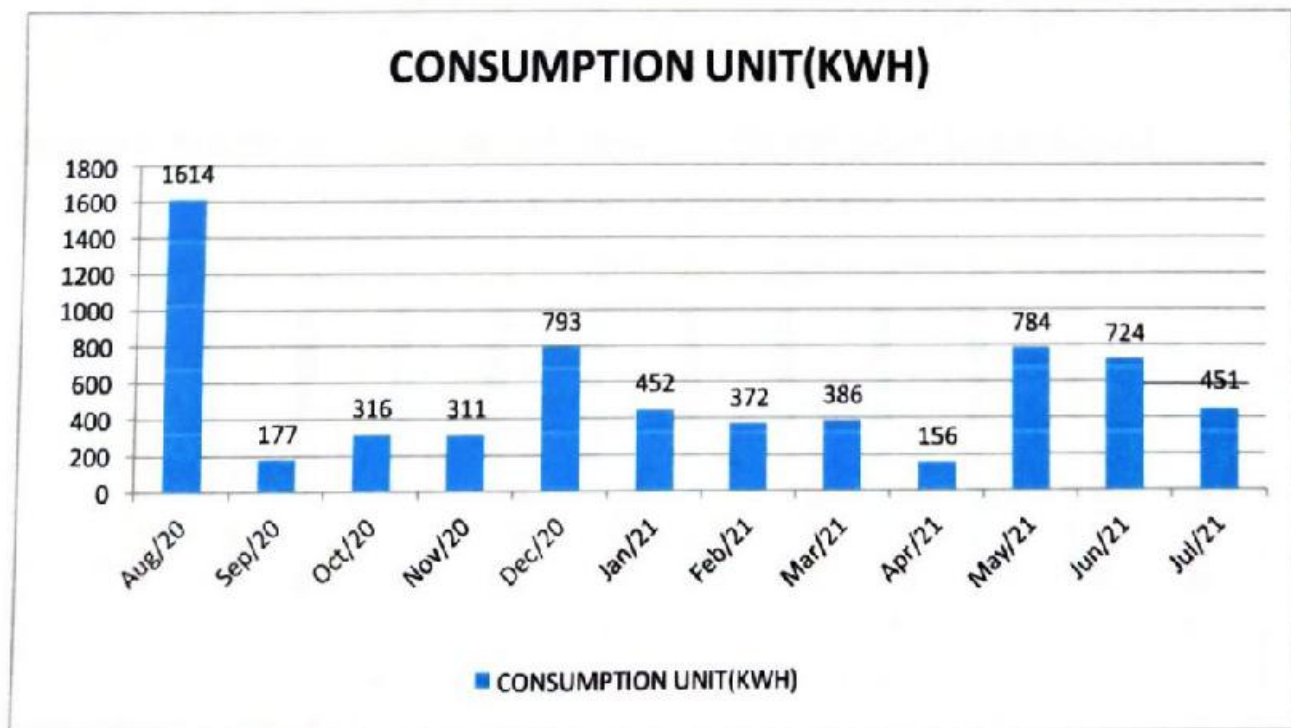
## 2.ELECTRICAL SYSTEM

### 2.1 Electricity Bill Summary-

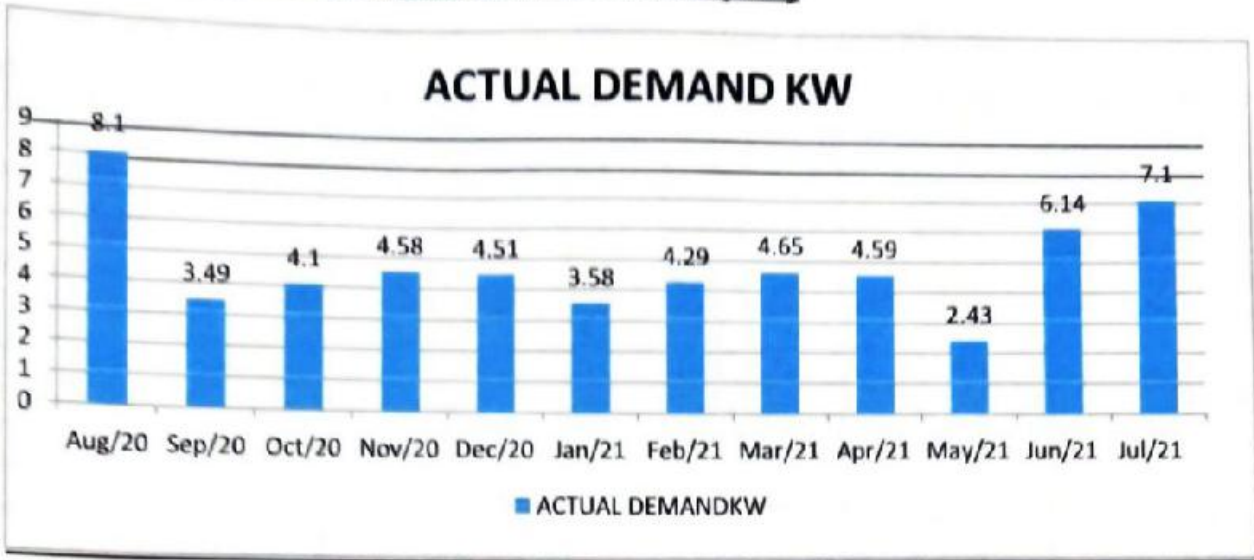
This table shows the Electricity Bill of last 12 Months From August 2020 to July 2021.

| Govt. College Khertha Electricity Consumption Details |                       |                      |                    |                 |              |                    |
|---|-----------------------|----------------------|--------------------|-----------------|--------------|--------------------|
| Bill Month  | Consumption Unit(kWH) | Contract Demand (kW) | Actual Demand (kW) | Amount (In Rs.) | Power Factor | Unit Cost (in Rs.) |
| Aug-20  | 1614                  | 12                   | 8.10               | 18760.00        | 0.69         | 7.80               |
| Sep-20  | 177                   | 12                   | 3.49               | 2300.00         | 0.75         | 6.50               |
| Oct-20  | 316                   | 12                   | 4.10               | 3240.00         | 0.86         | 6.50               |
| Nov-20  | 311                   | 12                   | 4.58               | 3190.00         | 0.78         | 6.50               |
| Dec-20  | 793                   | 12                   | 4.51               | 6920.00         | 0.72         | 7.80               |
| Jan-21  | 452                   | 12                   | 3.58               | 4220.00         | 0.69         | 7.80               |
| Feb-21  | 372                   | 12                   | 4.29               | 3630.00         | 0.71         | 7.80               |
| Mar-21  | 386                   | 12                   | 4.65               | 6616.89         | 0.73         | 7.80               |
| Apr-21  | 156                   | 12                   | 4.59               | 4450.45         | 0.74         | 7.80               |
| May-21  | 784                   | 12                   | 2.43               | 751.49          | 0.82         | 7.80               |
| Jun-21  | 724                   | 12                   | 6.14               | 5590.00         | 0.82         | 7.80               |
| Jul-21  | 451                   | 12                   | 7.10               | 9850.00         | 0.83         | 7.80               |
| <b>Total</b>  | <b>6536</b>           | --                   | --                 | <b>69518.83</b> | --           | --                 |
| <b>Average</b>  | <b>544.67</b>         | <b>12</b>            | <b>4.80</b>        | <b>5793.24</b>  | <b>0.76</b>  | <b>7.48</b>        |
| <b>Max</b>  | <b>1614</b>           | <b>12</b>            | <b>8.10</b>        | <b>18760</b>    | <b>0.86</b>  | <b>7.80</b>        |
| <b>Min</b>  | <b>156</b>            | <b>12</b>            | <b>2.43</b>        | <b>751.49</b>   | <b>0.69</b>  | <b>6.50</b>        |

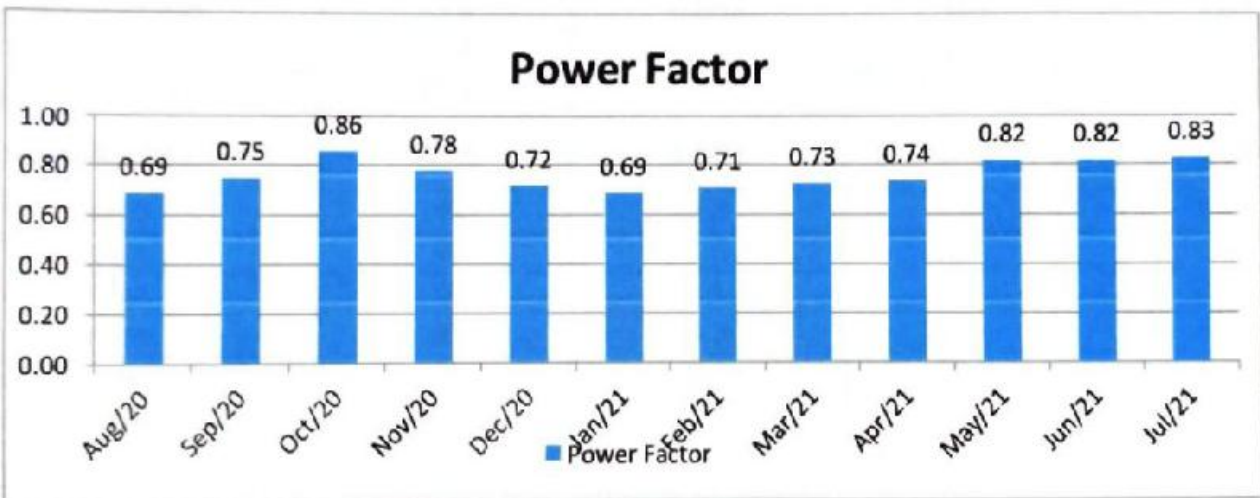
### Graphical Representation of Consumption Unit (KWH)



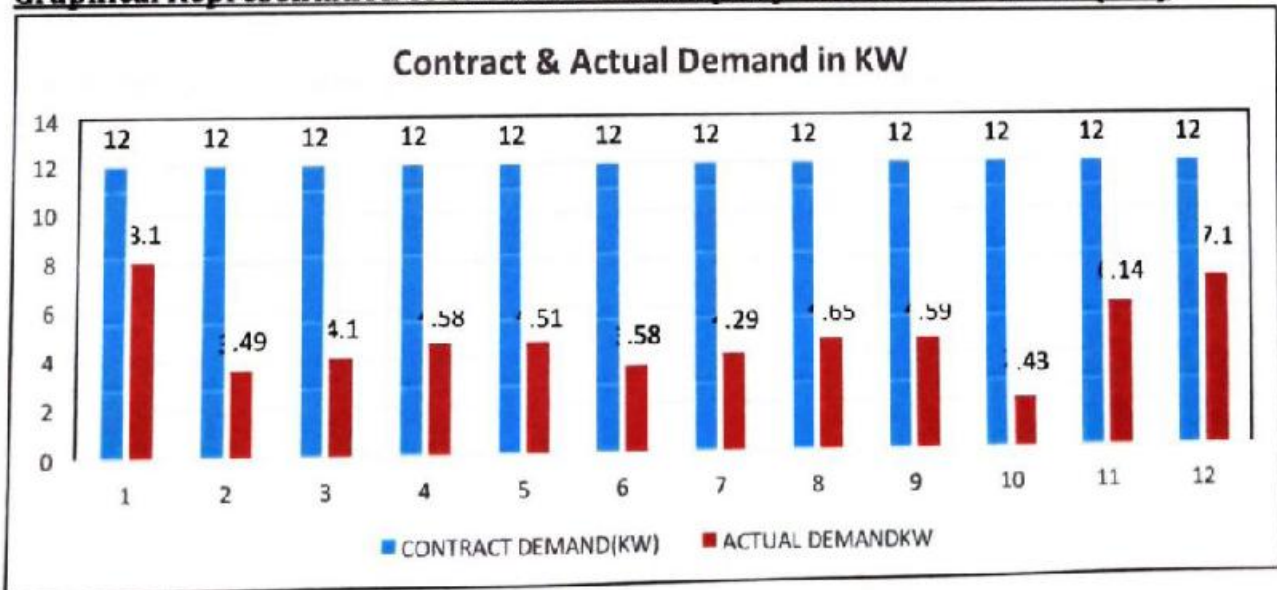
**Graphical Representation of Actual Demand (KW)**



**Graphical Representation of Power Factor**



**Graphical Representation of Contract Demand (KW) and Actual Demand (KW)**



## 2.2 Transformer Load Profile-

The Below Table Shows the Transformer Load Profile of Govt. College Khertha.

| Parameter                   | Unit       | Min          | Max           | Average       |
|-----------------------------|------------|--------------|---------------|---------------|
| R RMS Voltage               | V          | 406.3        | 430.7         | 424           |
| Y RMS Voltage               | V          | 430.4        | 439.3         | 433.89        |
| B RMS Voltage               | V          | 410.2        | 439.7         | 425.78        |
| R RMS Current               | Amp        | 0.3          | 11.96         | 10.98         |
| Y RMS Current               | Amp        | 0.65         | 26.43         | 18.8          |
| B RMS Current               | Amp        | 5.44         | 17.76         | 12.95         |
| L1 PF                       | -          | 0.204        | 0.999         | 0.974         |
| L2 PF                       | -          | 0.416        | 0.999         | 0.966         |
| L3 PF                       | -          | 0.892        | 0.991         | 0.974         |
| R Active Power              | KW         | 0.066        | 2.908         | 2.597         |
| Y Active Power              | KW         | 0.066        | 6.352         | 4.634         |
| B Active Power              | KW         | 1.263        | 4.38          | 3.167         |
| <b>Total Active Power</b>   | <b>KW</b>  | <b>1.395</b> | <b>13.64</b>  | <b>10.398</b> |
| R Apparent Power            | KVA        | 0.063        | 2.913         | 2.62          |
| Y Apparent Power            | KVA        | 0.159        | 6.526         | 4.791         |
| B Apparent Power            | KVA        | 1.372        | 4.426         | 3.243         |
| <b>Total Apparent Power</b> | <b>KVA</b> | <b>1.594</b> | <b>13.865</b> | <b>10.654</b> |
| R THD Voltage               | %          | 1.8          | 3.2           | 2.14          |
| Y THD Voltage               | %          | 1.6          | 2.1           | 1.92          |
| B THD Voltage               | %          | 2.1          | 2.6           | 2.42          |
| R THD Current               | %          | 4.3          | 25.2          | 6.44          |
| Y THD Current               | %          | 2.7          | 20            | 5.67          |
| B THD Current               | %          | 9.1          | 42.1          | 15.99         |

Note: Total Load profile of Transformer is enclosed in Annexure-1

### Observation:

1. All the electrical Parameters shown in above table are within acceptable Limit.



### 2.3 Voltage Unbalance of Transformer –

The Below Table Shows the Voltage Unbalance of Transformer, Govt. College Khertha

| S.No. | Rated voltage | Voltage Unbalance of Main Transformer |        |        |                 |                      |      |      |                   |                     |                   |
|-------|---------------|---------------------------------------|--------|--------|-----------------|----------------------|------|------|-------------------|---------------------|-------------------|
|       |               | Measured Voltage                      |        |        | Average Voltage | Calculated Unbalance |      |      | Maximum unbalance | % Voltage Unbalance | %Temperature rise |
|       |               | R                                     | Y      | B      |                 | R                    | Y    | B    |                   |                     |                   |
| 1     | 440.00        | 420.80                                | 417.50 | 419.00 | 419.10          | 1.70                 | 1.60 | 0.10 | 1.70              | 0.41                | 0.33              |
| 2     | 440.00        | 420.90                                | 417.50 | 419.00 | 419.13          | 1.77                 | 1.63 | 0.13 | 1.77              | 0.42                | 0.36              |
| 3     | 440.00        | 420.80                                | 417.50 | 418.90 | 419.07          | 1.73                 | 1.57 | 0.17 | 1.73              | 0.41                | 0.34              |
| 4     | 440.00        | 420.80                                | 417.40 | 418.90 | 419.03          | 1.77                 | 1.63 | 0.13 | 1.77              | 0.42                | 0.36              |
| 5     | 440.00        | 420.70                                | 417.40 | 418.80 | 418.97          | 1.73                 | 1.57 | 0.17 | 1.73              | 0.41                | 0.34              |
| 6     | 440.00        | 420.50                                | 417.20 | 418.40 | 418.70          | 1.80                 | 1.50 | 0.30 | 1.80              | 0.43                | 0.37              |
| 7     | 440.00        | 420.50                                | 417.20 | 418.30 | 418.67          | 1.83                 | 1.47 | 0.37 | 1.83              | 0.44                | 0.38              |
| 8     | 440.00        | 420.40                                | 417.10 | 418.30 | 418.60          | 1.80                 | 1.50 | 0.30 | 1.80              | 0.43                | 0.37              |
| 9     | 440.00        | 420.60                                | 417.30 | 418.30 | 418.73          | 1.87                 | 1.43 | 0.43 | 1.87              | 0.45                | 0.40              |
| 10    | 440.00        | 420.60                                | 417.70 | 418.40 | 418.90          | 1.70                 | 1.20 | 0.50 | 1.70              | 0.41                | 0.33              |
| 11    | 440.00        | 420.70                                | 417.80 | 418.50 | 419.00          | 1.70                 | 1.20 | 0.50 | 1.70              | 0.41                | 0.33              |
| 12    | 440.00        | 420.70                                | 417.80 | 418.60 | 419.03          | 1.67                 | 1.23 | 0.43 | 1.67              | 0.40                | 0.32              |
| 13    | 440.00        | 420.80                                | 417.80 | 418.50 | 419.03          | 1.77                 | 1.23 | 0.53 | 1.77              | 0.42                | 0.36              |
| 14    | 440.00        | 420.80                                | 417.90 | 418.50 | 418.20          | 2.60                 | 0.30 | 0.30 | 2.60              | 0.62                | 0.77              |
| 15    | 440.00        | 420.40                                | 417.50 | 418.30 | 418.73          | 1.67                 | 1.23 | 0.43 | 1.67              | 0.40                | 0.32              |
| 16    | 440.00        | 420.50                                | 417.60 | 418.40 | 418.83          | 1.67                 | 1.23 | 0.43 | 1.67              | 0.40                | 0.32              |
| 17    | 440.00        | 420.50                                | 417.70 | 418.40 | 418.87          | 1.63                 | 1.17 | 0.47 | 1.63              | 0.39                | 0.30              |
| 18    | 440.00        | 420.60                                | 417.70 | 418.50 | 418.93          | 1.67                 | 1.23 | 0.43 | 1.67              | 0.40                | 0.32              |
| 19    | 440.00        | 420.50                                | 417.70 | 418.40 | 418.87          | 1.63                 | 1.17 | 0.47 | 1.63              | 0.39                | 0.30              |
| 19    | 440.00        | 420.50                                | 417.70 | 418.40 | 418.87          | 1.63                 | 1.17 | 0.47 | 1.63              | 0.39                | 0.30              |
| 19    | 440.00        | 420.40                                | 417.60 | 418.30 | 418.77          | 1.63                 | 1.17 | 0.47 | 1.63              | 0.39                | 0.30              |
| 20    | 440.00        | 420.40                                | 417.60 | 418.30 | 418.77          | 1.63                 | 1.17 | 0.47 | 1.63              | 0.39                | 0.30              |
| 21    | 440.00        | 420.30                                | 417.50 | 418.30 | 418.70          | 1.60                 | 1.20 | 0.40 | 1.60              | 0.38                | 0.29              |

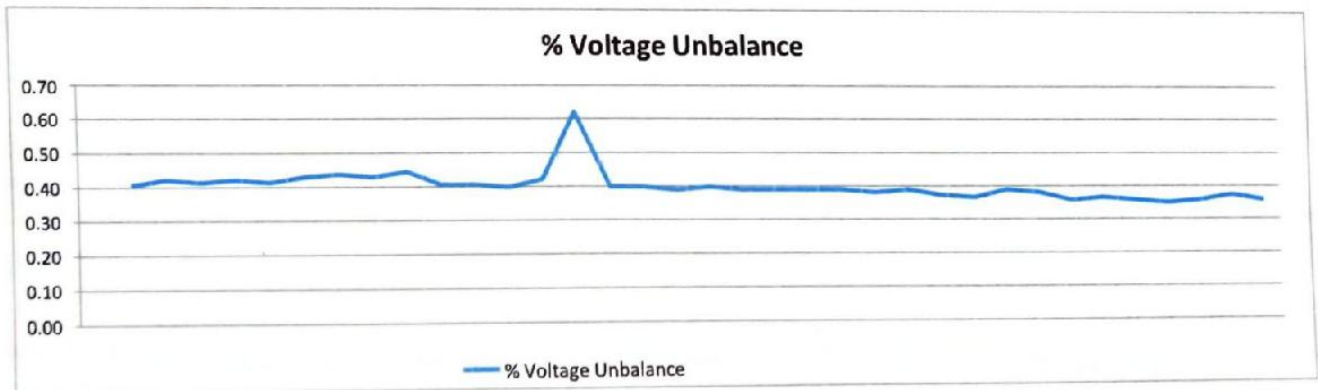
**Energy Audit of Govt. College Khertha, Balod, CG**

|    |        |        |        |        |        |      |      |      |      |      |             |
|----|--------|--------|--------|--------|--------|------|------|------|------|------|-------------|
| 22 | 440.00 | 420.40 | 417.60 | 418.30 | 418.77 | 1.63 | 1.17 | 0.47 | 1.63 | 0.39 | <b>0.30</b> |
| 23 | 440.00 | 420.50 | 417.70 | 418.60 | 418.93 | 1.57 | 1.23 | 0.33 | 1.57 | 0.37 | <b>0.28</b> |
| 24 | 440.00 | 420.50 | 417.70 | 418.70 | 418.97 | 1.53 | 1.27 | 0.27 | 1.53 | 0.37 | <b>0.27</b> |
| 25 | 440.00 | 420.60 | 417.70 | 418.60 | 418.97 | 1.63 | 1.27 | 0.37 | 1.63 | 0.39 | <b>0.30</b> |
| 26 | 440.00 | 420.40 | 417.50 | 418.50 | 418.80 | 1.60 | 1.30 | 0.30 | 1.60 | 0.38 | <b>0.29</b> |
| 27 | 440.00 | 420.20 | 417.50 | 418.40 | 418.70 | 1.50 | 1.20 | 0.30 | 1.50 | 0.36 | <b>0.26</b> |
| 28 | 440.00 | 420.30 | 417.50 | 418.50 | 418.77 | 1.53 | 1.27 | 0.27 | 1.53 | 0.37 | <b>0.27</b> |
| 29 | 440.00 | 420.20 | 417.50 | 418.40 | 418.70 | 1.50 | 1.20 | 0.30 | 1.50 | 0.36 | <b>0.26</b> |
| 30 | 440.00 | 420.10 | 417.30 | 418.50 | 418.63 | 1.47 | 1.33 | 0.13 | 1.47 | 0.35 | <b>0.25</b> |
| 31 | 440.00 | 420.20 | 417.30 | 418.60 | 418.70 | 1.50 | 1.40 | 0.10 | 1.50 | 0.36 | <b>0.26</b> |
| 32 | 440.00 | 420.30 | 417.30 | 418.60 | 418.73 | 1.57 | 1.43 | 0.13 | 1.57 | 0.37 | <b>0.28</b> |
| 33 | 440.00 | 420.10 | 417.20 | 418.50 | 418.60 | 1.50 | 1.40 | 0.10 | 1.50 | 0.36 | <b>0.26</b> |

**Observation: -**

1. It is Observed that the voltage unbalance is not Exceed 1%, and the Voltage Unbalance as per above Table is within acceptable range

**Graphical Representation of Percentage Voltage Unbalance**





Transformer

## 2.4 Power Quality

### Power Quality & Harmonics

Equipment based on frequency conversion techniques generates harmonics. With the increased use of such equipment's, harmonics related problems have enhanced.

The harmonic currents generated by different types of loads, travel back to the source. While traveling back to the source, they generate harmonic voltages, following simple Ohm's Law. Harmonic voltages, which appear on the system bus, are harmful to other equipment connected on the same bus. In general, sensitive electronic equipment connected on this bus, will be affected.

The Harmonics Level on the LT side of the Transformers was measured, details of which is as under:-

- Maximum Individual Frequency Voltage Harmonic: 3%
- Total Harmonic Distortion of the Voltage: 5%

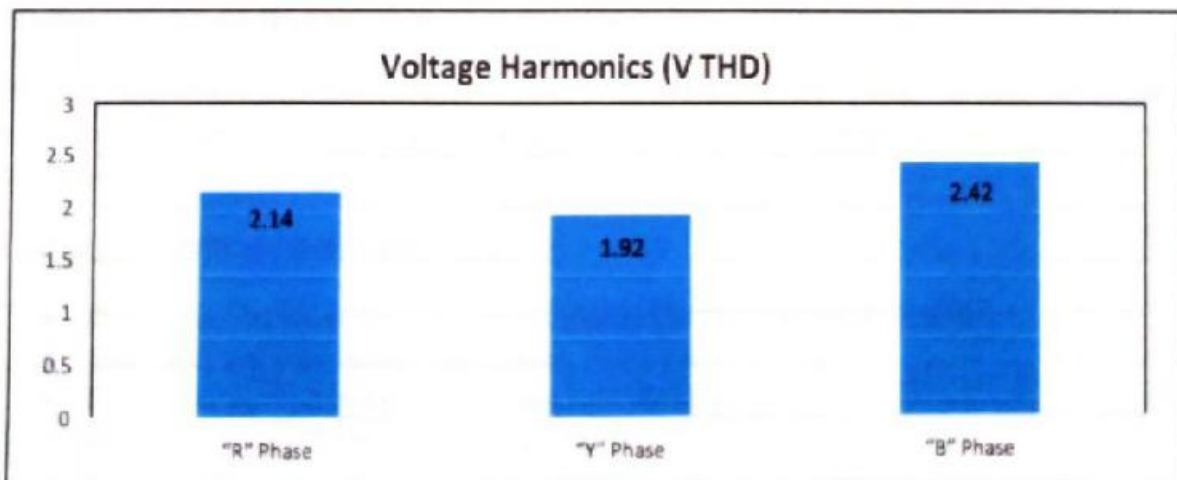
#### harmonic current limitations

| Maximum Harmonic Current Distortion in Percent of IL<br>120 Volt through 69 KV |      |         |         |         |      |      |
|--|------|---------|---------|---------|------|------|
| Individual Harmonic Order (Odd Harmonics)                                      |      |         |         |         |      |      |
| ISC/IL   | n<11 | 11<n<17 | 17<n<23 | 23<n<35 | 35<n | TDD  |
| <20*   | 4.0  | 2.0     | 1.5     | 0.6     | 0.3  | 5.0  |
| 20<50  | 7.0  | 3.5     | 2.5     | 1.0     | 0.5  | 8.0  |
| 50<100   | 10.0 | 4.5     | 4.0     | 1.5     | 0.7  | 12.0 |
| 100<1000   | 12.0 | 5.5     | 5.0     | 2.0     | 1.0  | 15.0 |
| >1000  | 15.0 | 7.0     | 6.0     | 2.5     | 1.4  | 20.0 |

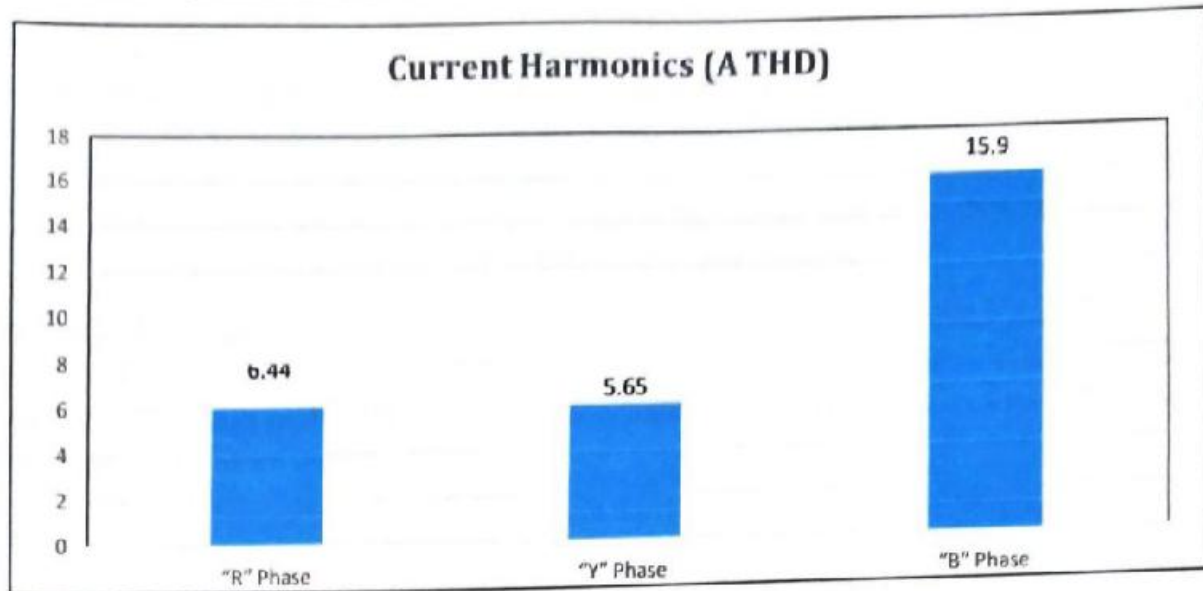
Even harmonics are limited to 25% of the odd harmonic limits  
TDD refers to Total Demand Distortion based on the average demand current at the fundamental frequency and measured at the PCC (Point of Common Coupling)  
\*All power generation equipment is limited to these values of current distortion regardless of ISC/IL value.  
ISC = Maximum short-circuit current at PCC.  
IL = Maximum demand load current (fundamental) at the PCC.  
n = Harmonic number.

| Particulars                      | TR   |
|----------------------------------|------|
| <b>Overall</b>                   |      |
| <b>Voltage Harmonics (V THD)</b> |      |
| "R" Phase                        | 2.14 |
| "Y" Phase                        | 1.92 |
| "B" Phase                        | 2.42 |
| <b>Current Harmonics (A THD)</b> |      |
| "R" Phase                        | 6.44 |
| "Y" Phase                        | 5.65 |
| "B" Phase                        | 15.9 |

### Graphical Representation of Voltage Harmonics (V THD)



### Graphical Representation of Current Harmonics (A THD)



#### **OBSERVATIONS & SUGGESTIONS:**

As detailed above, the voltage harmonics levels were around 1.92-2.42 % and the current harmonics levels were 5.65-15.9%. **The Overall harmonics are within limits.**

If Harmonics level is on higher side then appropriate harmonic filters may have to be installed in the system.

Different technologies are available mitigating the harmonics from the system. These include: **Detuned or broadband harmonic filters:** these filter banks are tuned to a frequency just below the predominant harmonic frequency. If the predominant harmonic frequency is say, 5<sup>th</sup>, it is normal practice to tune the filters to 189 Hz, or 3.78<sup>th</sup> harmonic, in 50 Hz systems.

**Active Harmonic Filters:** these units are designed in such manner that, they will inject harmonic frequencies in the system, which will be in anti-phase of the load harmonic frequencies. This will effectively free the source being loaded due to harmonics.

#### **MAJOR CAUSES OF HARMONICS**

Devices that draw non-sinusoidal currents when a sinusoidal voltage is applied create harmonics. Frequently these are devices that convert AC to DC. Some of these devices are listed below:

##### Electronic Switching Power Converters

- Computers, Uninterruptible power supplies (UPS), Solid-state rectifiers
- Electronic process control equipment, PLC's, etc.
- Electronic lighting ballasts, including light dimmer
- Reduced voltage motor controllers
- Arcing Devices
- Discharge lighting, e.g. Fluorescent, Sodium and Mercury vapor

- Arc furnaces, Welding equipment, Electrical traction system, Ferromagnetic Devices
- Transformers operating near saturation level
- Magnetic ballasts (Saturated Iron core)
- Induction heating equipment, Chokes, Motors, Appliances
- TV sets, air conditioners, washing machines, microwave ovens
- Fax machines, photocopiers, printers
- These devices use power electronics like SCRs, diodes, and thyristors, which are a growing percentage of the load in industrial power systems.

Many problems can arise from harmonic currents in a power system. Some problems are easy to detect; others exist and persist because harmonics are not suspected. Higher RMS current and voltage in the system are caused by harmonic currents, which can result in any of the problems listed below:

|   |                                |
|---|--------------------------------|
| Blinking of Incandescent Lights           | Transformer Saturation         |
| Capacitor Failure                         | Harmonic Resonance             |
| Circuit Breakers Tripping                 | Inductive Heating and Overload |
| Conductor Failure                         | Inductive Heating              |
| Electronic Equipment Shutting down        | Voltage Distortion             |
| Flickering of Fluorescent Lights          | Transformer Saturation         |
| Fuses Blowing for No Apparent Reason      | Inductive Heating and Overload |
| Motor Failures (overheating)              | Voltage Drop                   |
| Neutral Conductor and Terminal Failures   | Additive Triplen Currents      |
| Electromagnetic Load Failures             | Inductive Heating              |
| Overheating of Metal Enclosures           | Inductive Heating              |
| Power Interference on Voice Communication | Harmonic Noise                 |
| Transformer Failures                      | Inductive Heating              |

## 3.LIGHTING SYSTEM

### 3.1 Introduction

Lighting is an essential service in all the industries, Universities, Hospitals, Malls etc. Innovation and continuous improvement in the field of lighting, has given rise to tremendous energy saving opportunities in this area. Lighting is an area, which provides a major scope to achieve energy efficiency at the design stage, by incorporation of modern energy efficient lamps, luminaries and gears, apart from good operational practices.

### 3.2 Basic Terms in Lighting System and Features

#### • Lamps

Lamp is equipment, which produces light. The most commonly used lamps are described briefly as follows:

#### • Incandescent lamps:

Incandescent lamps produce light by means of a filament heated to incandescence by the flow of electric current through it. The principal parts of an incandescent lamp, also known as GLS (General Lighting Service) lamp include the filament, the bulb, the fill gas and the cap.

#### • Reflector lamps:

Reflector lamps are basically incandescent, provided with a high quality internal mirror, which follows exactly the parabolic shape of the lamp. The reflector is resistant to corrosion, thus making the lamp maintenance free and output efficient.

#### • Gas discharge lamps:

The light from a gas discharge lamp is produced by the excitation of gas contained in either a tubular or elliptical outer bulb. The most commonly used discharge lamps are as follows:

- Fluorescent tube lamps (FTL)
- Compact Fluorescent Lamps (CFL)
- Mercury Vapour Lamps
- Sodium Vapour Lamps
- Metal Halide Lamps

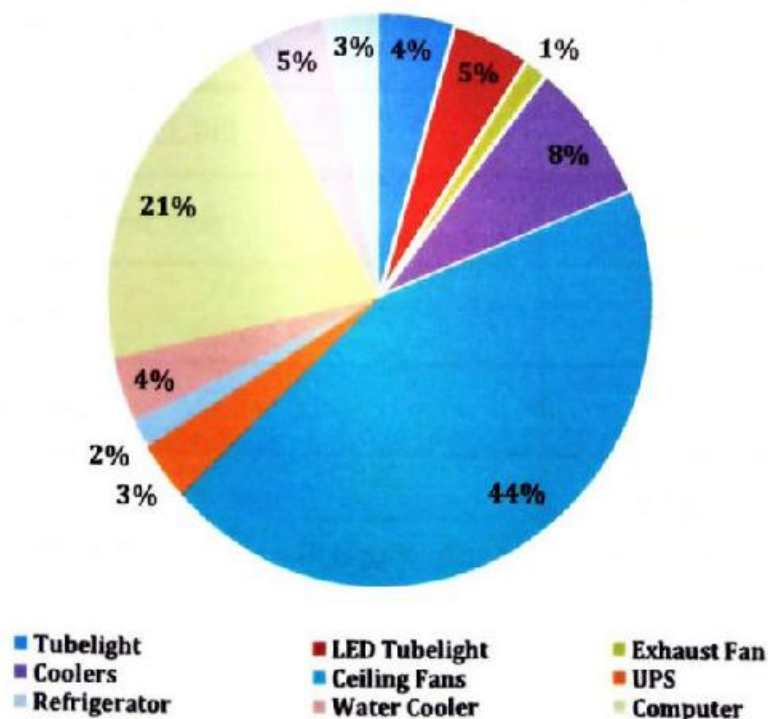
### 3.3 Light Details

Audit team done the Inventory with Wattage analysis of different type of lighting installed in the across the campus. Below table shows the overall fixtures install in the College.

| Inventory Details                      |                                |          |         |                   |
|--|--------------------------------|----------|---------|-------------------|
| S.No.                                  | Lighting Details/Type of light | Quantity | Wattage | Total load (Watt) |
| 1                                      | Tubelight                      | 25       | 40      | 1000              |
| 2                                      | LED Tubelight                  | 50       | 20      | 1012              |
| 3                                      | Exhaust Fan                    | 2        | 150     | 300               |
| 4                                      | Coolers                        | 4        | 450     | 1800              |
| 5                                      | Ceiling Fans                   | 120      | 80      | 9600              |
| Some other Energy Consuming Equipments |                                |          |         |                   |
| 6                                      | UPS                            | 2        | 360     | 720               |
| 7                                      | Refrigerator                   | 1        | 350     | 350               |
| 8                                      | Water Cooler                   | 1        | 800     | 800               |
| 9                                      | Computer                       | 15       | 300     | 4500              |
| 10                                     | Oven                           | 1        | 1000    | 1000              |
| 11                                     | Submersible Pump               | 1        | 746     | 746               |

### Representation of Percentage Wattage Consumption

% Wattage Consumption





**Observation:**

1. It is Observed from above table there are unconventional Tube Lights and fans are Installed in College Premises.

**Recommendation:**

1. It is Recommended to Replace all unconventional 40 Watt + 15 W (Choke) Tubelights Lights
2. It is Recommended to Replace inefficient Fans with BLDC Energy Efficient Fans.

**Energy Saving Potential**

The Below Table Shows the Energy Saving Potential of Govt. College Khertha.

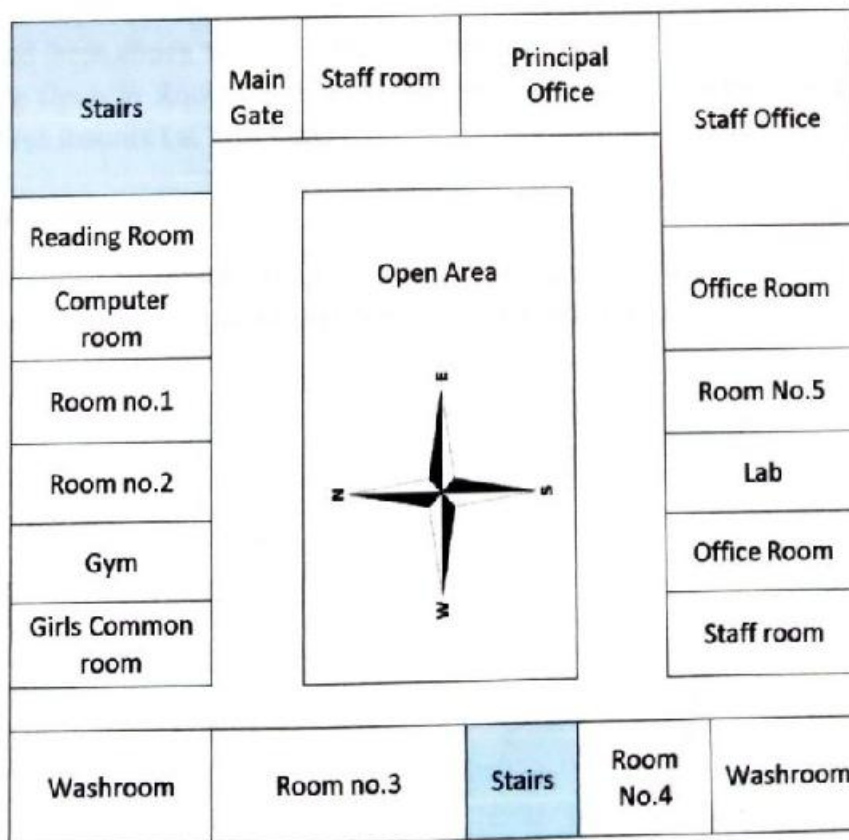
| <b>Replacement of Tube Light of 40W+15 W (choke) with 20W LED Tube</b> |              |              |
|--|--------------|--------------|
| <b>Particulars</b>   | <b>Value</b> | <b>Units</b> |
| Total Number of 55 Watt Tube Light                                     | 25           | Nos.         |
| Measured Watt  | 55           | Watts        |
| Total Watts  | 1375         | Watts        |
| Proposed watt after replacement  | 20           | Watts        |
| Total Watt After Replacement   | 875          | Watts        |
| Operating Hours in a day   | 7            | Hours        |
| Estimated Energy Saving after Replacement Annual KWH                   | 1837.5       | KWH          |
| Per Unit Cost as Per CSPDCL Bill                                       | 7.8          | Rs/kWh       |
| Estimated Cost Saving Per Year   | 14332.5      | Rs           |
| Cost of Per Fixtures   | 300          | Rs           |
| Total Investment Cost  | 7500         | Rs           |
| Payback  | 0.52         | Year         |

| Replacement of Ceiling Fan of 80W With EESL Energy Efficient BLDC 35W Ceiling Fan |        |        |
|---|--------|--------|
| Particulars   | Value  | Units  |
| Total Number of 80 Watt   | 120    | No.s   |
| Measured Watt   | 80     | Watts  |
| Total Watts   | 9600   | Watts  |
| Proposed watt after replacement   | 35     | Watts  |
| Total Watt After Replacement  | 5400   | Watts  |
| Operating Hours in a day  | 7      | Hours  |
| Estimated Energy Saving after Replacement Annual KWH                              | 11340  | KWH    |
| Per Unit Cost as Per CSPDCL Bill  | 7.80   | Rs/kWh |
| Estimated Cost Saving Per Year  | 88452  | Rs     |
| Cost of Per Fixtures  | 2500   | Rs     |
| Total Investment Cost   | 300000 | Rs     |
| Payback   | 3.39   | Year   |

**3.4. Lux Level: -**

**Lux** is a standardised unit of measurement of light level intensity, which is commonly referred to as "illuminance" or "illumination". A measurement of **1 lux is equal to the illumination of a one metre square surface** that is one metre away from a single candle.

**Ground Floor Layout**



**Ground Floor**

This table Shows the Average value of Lux

| Location          | Average Lux level with Open Window & Light | Average Lux level with Open Window only | Average Lux level with Light Only |
|-------------------|--|---|-----------------------------------|
| Reading Room      | 661  | 553                                     | 132                               |
| Computer room     | 658  | 551                                     | 129                               |
| Room No.1         | 660  | 555                                     | 135                               |
| Room No.2         | 665  | 553                                     | 131                               |
| Gym               | 659  | 549                                     | 127                               |
| Girls Common Room | 663  | 554                                     | 124                               |
| Room No.3         | 664  | 546                                     | 136                               |
| Room No.4         | 602  | 545                                     | 140                               |
| Staff Room        | 850  | 932                                     | 175                               |
| Office Room       | 848  | 929                                     | 169                               |
| Lab               | 850  | 935                                     | 171                               |
| Room No.5         | 855  | 927                                     | 177                               |
| Office Room       | 845  | 936                                     | 166                               |
| Principal Office  | 853  | 933                                     | 159                               |
| Staff Room        | 856  | 925                                     | 179                               |

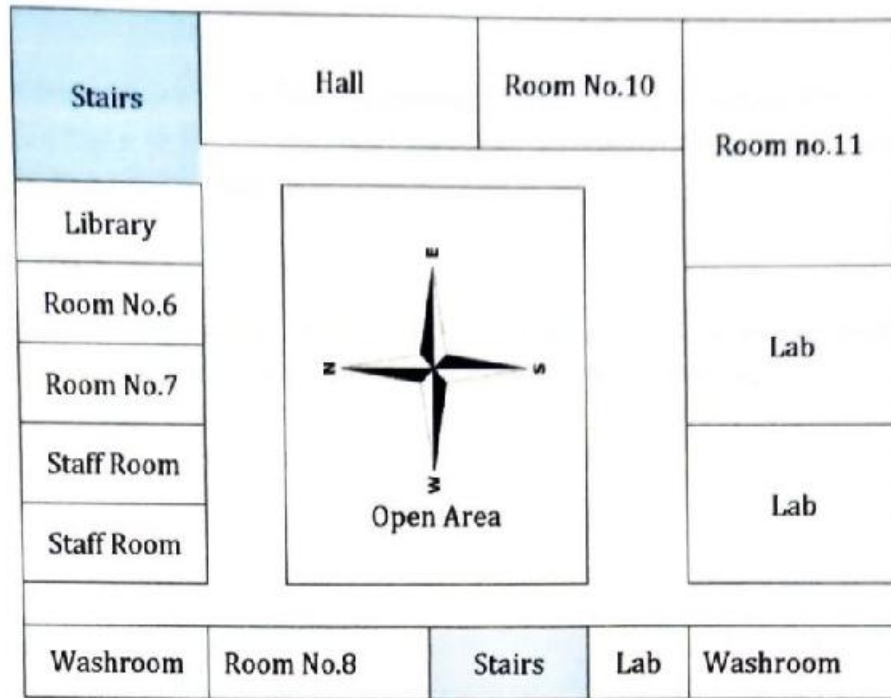
**Observation:**

1. It is observed from above table that the Average LUX Level is between 500 to 925 when all Windows are Open in Rooms and No Lights are Switched ON, **which is above Standard Level for Class Rooms i.e. 300 LUX.**

**Recommendation:**

1. It is recommended to switch off all the Lights during day time or off the half of the Total Lights of the Rooms if Required, which can save too Much Energy.

### First Floor Layout



### First Floor

This Table Shows the Average Value of Lux

| Location        | Average Lux level with Open Window & Light | Average Lux level with Open Window only | Average Lux level with Light Only |
|-----------------|--|---|-----------------------------------|
| Library         | 653  | 557                                     | 136                               |
| Room No.6       | 658  | 551                                     | 129                               |
| Room No.7       | 669  | 559                                     | 135                               |
| Store Room      | 659  | 549                                     | 127                               |
| Store Room      | 663  | 554                                     | 124                               |
| Room No.8       | 664  | 546                                     | 138                               |
| Lab             | 602  | 545                                     | 140                               |
| Lab             | 620  | 932                                     | 175                               |
| Lab             | 627  | 938                                     | 169                               |
| Room No.11      | 850  | 935                                     | 171                               |
| Conference Hall | 855  | 933                                     | 159                               |

**Observation:**

1. It is Observed from above table that the Average LUX Level is between 500 to 925 with only all Windows are Open in Rooms and No Lights are Switched ON, **which is above Standard Level for Class Rooms i.e. 300 LUX.**

**Recommendation:**

1. It is Recommended that Switch off all the Lights during day time or Can Switch ON Half of the Lights of the Rooms if Required, which can save too Much Energy.

## **4.SOLAR POWER GENERATION SYSTEM**

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### **4.1 Introduction**

Solar energy is the energy obtained by capturing heat and light from the Sun. Energy from the Sun is referred to as solar energy. Technology has provided a number of ways to utilize this abundant resource. It is considered a green technology because it does not emit greenhouse gases. Solar energy is abundantly available and has been utilized since long both as electricity and as a source of heat.

Solar technology can be broadly classified as –

- **Active Solar** – Active solar techniques include the use of photovoltaic systems, concentrated solar power and solar water heating to harness the energy. Active solar is directly consumed in activities such as drying clothes and warming of air.
- **Passive Solar** – Passive solar techniques include orienting a building to the Sun, selecting materials with favorable thermal mass or light-dispersing properties, and designing spaces that naturally circulate air.

### **4.2 Salient Benefits of Solar Energy**

1. Energy Saving
2. Reduce Operating Cost
3. Provides Unlimited and reliable Energy
4. A clean, silent and eco-friendly source of power
5. Energy Independence
6. Available throughout the year
7. Protection against future escalation of energy costs
8. Solar modules convert sunlight into electricity without pollution
9. Modular design and easily expandable

### 4.3 Proposed Solar Power Plant

There is a proposed plan for on-grid solar power plant of 10kwp at Govt. College Khertha

Benefits of on-grid Solar power System

1. Huge Reduction in Electricity Bill
2. Easy Maintenance
3. Synchronize with other source of Power
4. Huge Saving in Energy
5. Generated more power than other solar system



**Proposed Site for 10kwp Solar Power Plant**

College Proposed around 10000 Sq.ft. Space at roof of Govt. College Khertha for Installation of Maximum 20kwp on-grid solar power plant.

#### **Our Suggestion -**

During Energy Audit we have measured the electrical power at different blocks of Govt. College Khertha and we observed that the proposed site for the solar power plant has more than connected load.

We Suggest to install Solar power plant at the roof of college because the maximum load of College has connected in the said building.

Generally as a thumb rule, the solar module of 1kW generate approximately 4-5 kWh per day which requires 100 sq.ft area for installation.

The potential capacity of Solar module is depend upon the availability of shadow free area. Considering all the above points and present scenario of energy, there is potential of installation of capacity upto 10 kW. However considering the CAPEX issue, it is advisable to Installed Solar module Phase wise. Initially on pilot project basis, 5 KW modules can be installed and after desirable result, the management can look forward to install the Maximum capacity considering Techno-Economic Viability.

The suitable operating day considered for Govt. College Khertha is 300 days.

The resultant monitory benefit has been worked out as follows:

|  |                 |
|--|-----------------|
| Installation cost                            | Rs. 10.00 Lakhs |
| Daily Power generation                       | 20 kW           |
| Daily estimated power generation Hours       | 100 kwh         |
| Annual estimated power generation (300 Days) | 0.30 Lakh kWh   |
| Electricity Cost per unit                    | Rs. 7.80        |
| Annual cost saving                           | Rs. 2.34 Lakhs  |
| Simple Payback period                        | 4.2 Years       |

### **List of Solar Energy System Suppliers**

| <b>Name</b>              | <b>Contact Details</b>  |
|--------------------------|---|
| 1. Shankheshwar Energies | Sai Plaza , 2 <sup>nd</sup> floor , Beside National Convent School, Kushalpur Chowk, Raipur. HIG-C/1, infront of HDFC Bank, Shailendra Nagar , Raipur. Mo.-9755020202   |
| 2. Avarnaa Alliance,LLP. | C-31 Rameshwaram Delux, Baghmugaliya , Bhopal-462043. Mail:- <a href="mailto:support@avarnaalliance.in">support@avarnaalliance.in</a> ,<br>Contact:-Mr. Arpan -9977176764 (Director),<br><a href="http://www.avarnaalliance.in">www.avarnaalliance.in</a> . |
| 3. API Corporations.     | Ward No.-4 Marar Para Balod , Dist-Balod Pin-491226, Chhattisgarh.<br>Contact:- Pradeep Kumar Shrishrimal (Director) ,<br>Mo:-9685424400 , 9644443000 ,<br>Mail:- <a href="mailto:niknet16@gmail.com">niknet16@gmail.com</a>                                |



## 5. GENERAL TIPS FOR ENERGY CONSERVATION IN DIFFERENT UTILITIES SYSTEMS

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### 5.1 ELECTRICITY

- ❖ Schedule your operations to maintain a high load factor
- ❖ Minimize maximum demand by tripping loads through a demand controller
- ❖ Use standby electric generation equipment for on-peak high load periods.
- ❖ Correct power factor to at least 0.99 under rated load conditions.
- ❖ Set transformer taps to optimum settings.
- ❖ Shut off unnecessary computers, printers, and copiers at night.

### 5.2 FANS

- ❖ Use smooth, well-rounded air inlet cones for fan air intakes.
- ❖ Avoid poor flow distribution at the fan inlet.
- ❖ Minimize fan inlet and outlet obstructions.
- ❖ Clean screens, filters, and fan blades regularly
- ❖ Use aerofoil-shaped fan blades.
- ❖ Minimize fan speed.
- ❖ Use low-slip or flat belts.
- ❖ Check belt tension regularly.
- ❖ Eliminate variable pitch pulleys.
- ❖ Use variable speed drives for large variable fan loads.
- ❖ Use energy-efficient motors for continuous or near-continuous operation
- ❖ Eliminate leaks in ductwork.
- ❖ Minimize bends in ductwork
- ❖ Turn fans off when not needed

### 5.3 PUMPS

- ❖ Operate pumping near best efficiency point.
- ❖ Modify pumping to minimize throttling.
- ❖ Adapt to wide load variation with variable speed drives or sequenced control of smaller units.
- ❖ Stop running both pumps -- add an auto-start for an on-line spare or add a booster pump in the problem area.
- ❖ Use booster pumps for small loads requiring higher pressures.
- ❖ Increase fluid temperature differentials to reduce pumping rates.
- ❖ Repair seals and packing to minimize water waste.
- ❖ Balance the system to minimize flows and reduce pump power requirements.
- ❖ Use siphon effect to advantage: don't waste pumping head with a free-fall (gravity) return.

## **5.4 LIGHTING**

- ❖ Reduce excessive illumination levels to standard levels using switching, delamping, etc. (Know the electrical effects before doing delamping.)
- ❖ Aggressively control lighting with clock timers, delay timers, photocells, and/or occupancy sensors.
- ❖ Install efficient alternatives to incandescent lighting, mercury vapor lighting, etc.
- ❖ Efficiency (lumens/watt) of various technologies range from best to worst approximately as follows: low pressure sodium, high pressure sodium, metal halide, fluorescent, mercury vapor, incandescent.
- ❖ Select ballasts and lamps carefully with high power factor and long-term efficiency in mind.
- ❖ Upgrade obsolete fluorescent systems to Compact fluorescents and electronic ballasts
- ❖ Consider lowering the fixtures to enable using less of them.
- ❖ Consider day lighting, skylights, etc.
- ❖ Consider painting the walls a lighter color and using less lighting fixtures or lower wattages.
- ❖ Use task lighting and reduce background illumination.
- ❖ Re-evaluate exterior lighting strategy, type, and control. Control it aggressively.
- ❖ Change exit signs from incandescent to LED.

## **5.5. WATER & WASTE WATER**

- ❖ Recycle water, particularly for uses with less-critical quality requirements.
- ❖ Recycle water, especially if sewer costs are based on water consumption.
- ❖ Balance closed systems to minimize flows and reduce pump power requirements.
- ❖ Eliminate once-through cooling with water.
- ❖ Use the least expensive type of water that will satisfy the requirement.
- ❖ Fix water leaks.
- ❖ Test for underground water leaks. (It's easy to do over a holiday shutdown.)
- ❖ Check water overflow pipes for proper operating level.
- ❖ Automate blowdown to minimize it.
- ❖ Provide proper tools for wash down -- especially self-closing nozzles.
- ❖ Install efficient irrigation.
- ❖ Reduce flows at water sampling stations.
- ❖ Eliminate continuous overflow at water tanks.
- ❖ Promptly repair leaking toilets and faucets.
- ❖ Use water restrictors on faucets, showers, etc.
- ❖ Use self-closing type faucets in restrooms.
- ❖ Use the lowest possible hot water temperature.

## **6. ENERGY MANAGEMENT STRATEGY**

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Energy Management should be seen as a continuous process. Strategies should be reviewed annually and revised as necessary. The key activities suggested have been outlined below:

### **6.1 IDENTIFY A STRATEGIC CORPORATE APPROACH**

The starting point in energy management is to identify a strategic corporate approach to energy management. Clear accountability for energy usage needs to be established, appropriate financial and staffing resources must be allocated and reporting procedures initiated. An energy management program requires commitment from the whole organization in order to be successful. A record of Energy consumption must be kept and monitored on regular basis, to optimize the Energy consumption. For this, various meters may have to be installed.

### **6.2. DESIGNATE AN ENERGY MANAGER**

An Energy Manager must be identified and time bound responsibility must be given to him in getting implemented the findings of the Energy Audit points, which the Plant Establishment has planned to implement.

### **6.3. SET UP AN ENERGY MONITORING AND REPORTING SYSTEM**

Successful energy management requires the establishment of a system to collect/analyze and report the energy costs and consumption pattern. This will enable an overview of energy use and its related costs, as well as facilitating the identification of savings that might otherwise not be detected. The system needs to record both historical and ongoing energy use, as well as cost information from billing data, and capable of producing summary reports on a regular basis. This information will provide the means by which trends can be analyzed and reviewed for corrective measures.

### **6.4. IMPLEMENT A STAFF AWARENESS AND TRAINING PROGRAM**

A key ingredient to the success of an energy management program is maintaining a high level of awareness among staff. This can be achieved in a number of ways, including formal training, newsletters, posters and publications. It is important to communicate program plans and case studies that demonstrate savings, and to report results at least at 12-month intervals. Staff may need training from specialists on energy saving practices and equipments.

**List of Energy Efficient Equipment Suppliers**

| Product/ Equipment         | Contact Details   |
|----------------------------|---|
| Automation, Panel Meters   | Conzerv System<br>44P Electronic City Phase -II, East Hosur Road,<br>Bangalore - 560100 Ph: 080-51189700<br><a href="http://www.conzerv.com">www.conzerv.com</a>  |
| Automation, Panel Meters   | Selec controls Pvt Ltd<br>E - 121, Ansa Industrial Estate, Saki Vihar Road,<br>Mumbai 400072 Ph: 022-28471882, 28476443<br><a href="http://www.selecindia.com">www.selecindia.com</a>   |
| Plant Automation, sensors, | Electro Art<br>Plot No K-11, MIDC Area, Ambad, Nashik -422010,<br>Ph: 0253-5603954, 2380918<br><a href="http://www.electronicswitchesindia.com">www.electronicswitchesindia.com</a>   |
| Capacitors                 | Asian Electronics Ltd.<br>Plot 68, MIDC, Satpur, Nasik, Nashik - 422 007  |
| Capacitors                 | Shreem Capacitors Pvt. Ltd.<br>7/39, Vikram Vihar, Lajpat Nagar-IV, New Delhi - 110 024   |
| Capacitors and APFC Panels | Matrix Controls & Engineers Pvt Ltd<br>Rajeev Batra 9811624440, Rajeev@matrixcapacior.com<br>E- 725 DSIDC, Industrial Complex, Narela, GT Road,<br>Delhi - 110040 Ph: 01127786945 / 46 / 47<br><a href="http://www.matrixcapacitor.com">www.matrixcapacitor.com</a> |
| Capacitors and APFC Panels | Standard Capacitors<br>B-70/43, DSIDC Complex, Lawrence road Industrial<br>Area, Delhi - 110035<br>Ph: 011 -27181490, 27151027<br><a href="http://www.standardcapacitors.com">www.standardcapacitors.com</a>  |
| Capacitors and APFC Panels | Saif Electronics<br>174, Hira Plant, 1 <sup>st</sup> Floor, Carnac Road,<br>Opposite Police Commissioner office ,<br>Mumbai - 400002 Ph : 022 - 22064626 ,<br>22086613<br><a href="http://www.saifel.com">www.saifel.com</a>  |
| LED lighting               | Synergy Solar (P) ltd<br>SCO 133, sector 28D,<br>Chandigarh Ph 0172-<br>6451133<br><a href="http://www.synergysolars.com">www.synergysolars.com</a>   |
| Lighting Systems           | Philips India Ltd<br>Regional office-North, 9th floor Ashoka<br>Estate, 24, Barakhamba Road New Delhi -<br>110 001<br>Telephone No.: 3353280, 3317442, Fax No.: 3314332   |
| Lighting Systems           | Crompton Greaves Ltd.<br>Lighting Business Group, 405, Concorde, RC<br>Dutt Road, Baroda - 390 007  |
| Lighting Systems           | OSRAM India Ltd. Signature Towers,<br>11th Floor, Tower B, South City-I, Gurgaon 122001,  |

**Energy Audit of Govt. College Khertha, Balod, CG**

| <b>Product/Equipment</b> | <b>Contact Details</b>  |
|--------------------------|---|
| Lighting Systems         | Fax: 0124- 6526184<br>Asian Electronics<br>Surya Place, First Floor, K-185/1, Sarai   |
| Lighting Systems         | Julena, New Friends Colony, New Delhi<br>- 110 025<br>Asian Electronics<br>Surya Place, First Floor, K-185/1, Sarai   |
| Lighting Systems         | Julena, New Friends Colony, New Delhi<br>- 110 025<br>Philips India Limited , Technopolis<br>Knowledge Park, Nelco Complex,<br>Mahakali Caves Road, Chakala,<br>Andheri (East), Mumbai 400 093.<br>Tel : 022 56912000 |
| Lighting Systems         | Surya Roshni Ltd.<br>Padma Tower-I, Rajendra Palace, New Delhi 110 006.   |
| Lighting Systems         | Wipro Limited<br>Sco 196-197, Sector 34-A, Chandigarh - 160 022   |
| Lighting Systems         | OSRAM India Ltd. Signature Towers,<br>11th Floor, Tower B, South City-I, Gurgaon<br>122001, Haryana Tel: 0124- 6526175,<br>6526178, 6526185<br>Fax: 0124- 6526184   |

Note: - The suppliers mentioned above are not the only ones or the best in the market. The management may contact other suppliers for competitive rates/ specifications.

**Load Profile of TR with Normal Load**

Annexure1

Date:24.08.2021

| Time:       | Voltage |         |         | Current |         |         | Load (KW) |         |         | Total Load |          | Power factor |
|-------------|---------|---------|---------|---------|---------|---------|-----------|---------|---------|------------|----------|--------------|
|             | R-phase | Y-phase | B-Phase | R-phase | Y-phase | B-Phase | R-phase   | Y-phase | B-Phase | PT (KW)    | ST (KVA) |              |
| 01:05:00 PM | 409.7   | 439.3   | 411     | 0.3     | 1.66    | 5.63    | 0.07      | 0.41    | 1.31    | 1.78       | 1.91     | 0.93         |
| 01:05:01 PM | 409.5   | 439.3   | 411     | 0.3     | 1.66    | 5.59    | 0.07      | 0.41    | 1.30    | 1.78       | 1.90     | 0.94         |
| 01:05:02 PM | 409.7   | 439.1   | 410.9   | 0.3     | 1.66    | 7.28    | 0.07      | 0.41    | 1.66    | 2.14       | 2.32     | 0.92         |
| 01:05:03 PM | 409.5   | 439.3   | 410.8   | 0.3     | 1.66    | 6.65    | 0.07      | 0.41    | 1.55    | 2.03       | 2.16     | 0.94         |
| 01:05:04 PM | 409.4   | 439.2   | 410.6   | 0.3     | 1.66    | 6.6     | 0.07      | 0.41    | 1.54    | 2.01       | 2.15     | 0.94         |
| 01:05:05 PM | 409.4   | 439     | 410.6   | 0.3     | 1.66    | 6.6     | 0.07      | 0.41    | 1.54    | 2.02       | 2.15     | 0.94         |
| 01:05:06 PM | 409.4   | 438.9   | 410.6   | 0.3     | 1.66    | 6.51    | 0.07      | 0.41    | 1.52    | 1.99       | 2.13     | 0.94         |
| 01:05:07 PM | 409.1   | 438.7   | 410.3   | 0.3     | 1.66    | 5.75    | 0.07      | 0.41    | 1.33    | 1.81       | 1.94     | 0.93         |
| 01:05:08 PM | 409     | 438.6   | 410.2   | 0.3     | 1.66    | 5.52    | 0.07      | 0.41    | 1.28    | 1.76       | 1.88     | 0.94         |
| 01:05:09 PM | 409.5   | 438.9   | 410.6   | 0.3     | 1.86    | 5.53    | 0.07      | 0.42    | 1.28    | 1.77       | 1.93     | 0.92         |
| 01:05:10 PM | 409.8   | 439.3   | 410.8   | 0.3     | 1.68    | 5.54    | 0.07      | 0.41    | 1.29    | 1.76       | 1.89     | 0.93         |
| 01:05:11 PM | 409.8   | 439.2   | 410.9   | 0.3     | 1.67    | 5.56    | 0.07      | 0.41    | 1.29    | 1.77       | 1.89     | 0.93         |
| 01:05:12 PM | 409.4   | 439     | 410.6   | 0.3     | 1.67    | 5.52    | 0.07      | 0.41    | 1.28    | 1.76       | 1.88     | 0.93         |
| 01:05:13 PM | 409.2   | 439     | 410.4   | 0.3     | 1.67    | 5.51    | 0.07      | 0.41    | 1.28    | 1.75       | 1.88     | 0.93         |
| 01:05:14 PM | 409.1   | 439     | 410.3   | 0.3     | 1.67    | 5.53    | 0.07      | 0.41    | 1.28    | 1.76       | 1.88     | 0.93         |
| 01:05:15 PM | 409.2   | 439.1   | 410.5   | 0.3     | 1.67    | 5.55    | 0.07      | 0.41    | 1.29    | 1.76       | 1.89     | 0.93         |
| 01:05:16 PM | 409.1   | 439     | 410.5   | 0.3     | 1.67    | 5.49    | 0.07      | 0.41    | 1.27    | 1.75       | 1.87     | 0.93         |
| 01:05:17 PM | 415.1   | 438.7   | 416.7   | 0.41    | 1.67    | 5.47    | 0.09      | 0.41    | 1.27    | 1.76       | 1.89     | 0.93         |
| 01:05:18 PM | 424.1   | 438.7   | 429.9   | 1.8     | 1.67    | 5.48    | 0.12      | 0.41    | 1.27    | 1.79       | 2.24     | 0.80         |
| 01:05:19 PM | 429.9   | 438.6   | 438.6   | 2.43    | 1.66    | 6.13    | 0.13      | 0.41    | 1.42    | 1.95       | 2.57     | 0.76         |
| 01:05:20 PM | 429.8   | 438.5   | 438.5   | 2.43    | 1.66    | 6.19    | 0.13      | 0.41    | 1.45    | 1.98       | 2.58     | 0.77         |
| 01:05:21 PM | 429.9   | 438.5   | 438.4   | 2.43    | 1.66    | 6.21    | 0.13      | 0.41    | 1.45    | 1.99       | 2.59     | 0.77         |
| 01:05:22 PM | 430     | 438.6   | 438.6   | 2.43    | 1.66    | 6.09    | 0.12      | 0.41    | 1.42    | 1.95       | 2.56     | 0.76         |
| 01:05:23 PM | 429.9   | 438.7   | 438.9   | 2.43    | 1.66    | 5.51    | 0.12      | 0.41    | 1.28    | 1.81       | 2.41     | 0.75         |
| 01:05:24 PM | 430     | 438.9   | 439.2   | 2.43    | 1.66    | 5.55    | 0.12      | 0.41    | 1.29    | 1.82       | 2.43     | 0.75         |
| 01:05:25 PM | 430.4   | 439     | 439.5   | 2.43    | 1.66    | 5.47    | 0.12      | 0.41    | 1.27    | 1.80       | 2.41     | 0.75         |

|              |            |            |            |             |             |             |             |             |             |             |             |             |
|--------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 01:05:26 PM  | 430.5      | 439        | 439.7      | 2.43        | 1.66        | 5.49        | 0.12        | 0.41        | 1.27        | 1.80        | 2.41        | 0.75        |
| 01:05:27 PM  | 430.6      | 438.9      | 439.5      | 2.43        | 1.66        | 5.48        | 0.12        | 0.41        | 1.27        | 1.80        | 2.41        | 0.75        |
| 01:05:28 PM  | 430.7      | 439.1      | 439.5      | 2.43        | 1.66        | 5.44        | 0.13        | 0.41        | 1.26        | 1.79        | 2.40        | 0.75        |
| 01:05:29 PM  | 430.5      | 438.9      | 439.3      | 2.43        | 1.66        | 5.45        | 0.13        | 0.41        | 1.26        | 1.79        | 2.40        | 0.75        |
| 01:05:30 PM  | 430.4      | 438.9      | 439.3      | 2.43        | 1.66        | 5.53        | 0.13        | 0.41        | 1.28        | 1.81        | 2.42        | 0.75        |
| 01:05:31 PM  | 430.4      | 439.1      | 439.6      | 2.44        | 1.66        | 5.5         | 0.13        | 0.41        | 1.28        | 1.81        | 2.42        | 0.75        |
| 01:05:32 PM  | 429.8      | 439.1      | 438.3      | 2.59        | 1.66        | 6.04        | 0.21        | 0.41        | 1.36        | 1.97        | 2.59        | 0.76        |
| <b>Total</b> | <b>418</b> | <b>439</b> | <b>422</b> | <b>1.18</b> | <b>1.67</b> | <b>5.78</b> | <b>0.09</b> | <b>0.41</b> | <b>1.34</b> | <b>1.84</b> | <b>2.17</b> | <b>0.86</b> |

**Load Profile with Full load**

Date:24.08.2021

| Time:       | Voltage |         |         | Current |         |         | Load (KW) |         |         | Total Load |          | Power factor |
|-------------|---------|---------|---------|---------|---------|---------|-----------|---------|---------|------------|----------|--------------|
|             | R-phase | Y-phase | B-Phase | R-phase | Y-phase | B-Phase | R-phase   | Y-phase | B-Phase | PT (KW)    | ST (KVA) | PFT          |
| 01:10:01 PM | 426.9   | 435.3   | 428     | 11.93   | 20.06   | 9.91    | 2.899     | 4.801   | 2.409   | 10.108     | 10.405   | 0.971        |
| 01:10:11 PM | 427.1   | 435.3   | 428.4   | 11.94   | 20.12   | 9.94    | 2.903     | 4.818   | 2.416   | 10.137     | 10.433   | 0.972        |
| 01:10:21 PM | 426.6   | 434.7   | 427.5   | 11.92   | 20.02   | 11.53   | 2.898     | 4.788   | 2.822   | 10.508     | 10.794   | 0.974        |
| 01:10:31 PM | 426.8   | 434.8   | 427.2   | 11.94   | 20.1    | 13.64   | 2.901     | 4.811   | 3.327   | 11.039     | 11.346   | 0.973        |
| 01:10:41 PM | 426.9   | 434.9   | 427.4   | 11.93   | 20.04   | 12.74   | 2.901     | 4.799   | 3.118   | 10.818     | 11.11    | 0.974        |
| 01:10:51 PM | 426.9   | 435     | 427.3   | 11.93   | 20.06   | 12.04   | 2.899     | 4.804   | 2.945   | 10.647     | 10.936   | 0.974        |
| 01:11:01 PM | 426.6   | 434.8   | 426.7   | 11.91   | 20.06   | 13.7    | 2.891     | 4.806   | 3.34    | 11.037     | 11.343   | 0.973        |
| 01:11:11 PM | 426.8   | 434.9   | 426.5   | 11.92   | 20.08   | 15.57   | 2.896     | 4.812   | 3.811   | 11.519     | 11.82    | 0.975        |
| 01:11:21 PM | 426.8   | 434.7   | 426.7   | 11.93   | 20.04   | 14.78   | 2.9       | 4.801   | 3.612   | 11.313     | 11.612   | 0.974        |
| 01:11:31 PM | 427.2   | 434.9   | 426.8   | 11.93   | 20.04   | 15.49   | 2.902     | 4.802   | 3.792   | 11.496     | 11.796   | 0.975        |
| 01:11:41 PM | 427.4   | 435.1   | 427.2   | 11.94   | 20.04   | 14.76   | 2.907     | 4.806   | 3.612   | 11.325     | 11.626   | 0.974        |
| 01:11:51 PM | 426.7   | 434.7   | 426.5   | 11.91   | 20.02   | 14.77   | 2.894     | 4.797   | 3.61    | 11.301     | 11.598   | 0.974        |
| 01:12:01 PM | 426.3   | 434.4   | 426     | 11.9    | 20.02   | 15.32   | 2.886     | 4.793   | 3.74    | 11.419     | 11.721   | 0.974        |
| 01:12:11 PM | 426.9   | 434.8   | 426.4   | 11.92   | 20.05   | 14.76   | 2.894     | 4.806   | 3.609   | 11.31      | 11.608   | 0.974        |
| 01:12:21 PM | 426.8   | 434.7   | 426.4   | 11.91   | 20.01   | 14.76   | 2.893     | 4.795   | 3.609   | 11.297     | 11.595   | 0.974        |

|             |       |       |       |       |       |       |       |       |       |        |        |       |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|-------|
| 01:12:31 PM | 427   | 434.9 | 426.5 | 11.91 | 20.01 | 15.57 | 2.893 | 4.798 | 3.813 | 11.503 | 11.801 | 0.975 |
| 01:12:41 PM | 427   | 434.6 | 426.5 | 11.91 | 20.03 | 14.76 | 2.896 | 4.799 | 3.606 | 11.301 | 11.598 | 0.974 |
| 01:12:51 PM | 426.8 | 434.4 | 426.3 | 11.9  | 20.07 | 14.77 | 2.89  | 4.811 | 3.609 | 11.31  | 11.604 | 0.975 |
| 01:13:01 PM | 426.3 | 434.2 | 426.1 | 11.9  | 19.97 | 14.79 | 2.888 | 4.782 | 3.629 | 11.299 | 11.576 | 0.976 |
| 01:13:11 PM | 426.4 | 434   | 426.5 | 11.9  | 20    | 14.12 | 2.891 | 4.788 | 3.464 | 11.143 | 11.418 | 0.976 |
| 01:13:21 PM | 425.7 | 434   | 425.9 | 11.88 | 19.95 | 14.75 | 2.879 | 4.773 | 3.618 | 11.27  | 11.546 | 0.976 |
| 01:13:31 PM | 425.5 | 433.9 | 425.9 | 11.88 | 19.97 | 14.11 | 2.878 | 4.778 | 3.461 | 11.117 | 11.389 | 0.976 |
| 01:13:41 PM | 425.3 | 433.8 | 425.6 | 11.91 | 19.94 | 14.09 | 2.883 | 4.771 | 3.454 | 11.108 | 11.38  | 0.976 |
| 01:13:51 PM | 424.8 | 433.6 | 425.1 | 11.86 | 19.95 | 14.62 | 2.87  | 4.772 | 3.584 | 11.225 | 11.495 | 0.977 |
| 01:14:01 PM | 425   | 433.7 | 425.3 | 11.86 | 19.92 | 14.08 | 2.869 | 4.763 | 3.45  | 11.082 | 11.352 | 0.976 |
| 01:14:11 PM | 424.9 | 433.6 | 425   | 11.87 | 21.28 | 14.7  | 2.872 | 5.102 | 3.605 | 11.579 | 11.845 | 0.978 |
| 01:14:21 PM | 426.1 | 434.5 | 426   | 11.89 | 19.96 | 14.08 | 2.885 | 4.783 | 3.456 | 11.123 | 11.396 | 0.976 |
| 01:14:31 PM | 425.7 | 434.3 | 425.8 | 11.89 | 19.96 | 14.09 | 2.88  | 4.781 | 3.456 | 11.118 | 11.388 | 0.976 |
| 01:14:41 PM | 425.5 | 433.8 | 425.7 | 11.89 | 22.85 | 14.07 | 2.881 | 5.518 | 3.454 | 11.853 | 12.092 | 0.98  |
| 01:14:51 PM | 425.8 | 434.4 | 425.8 | 11.89 | 19.99 | 14.07 | 2.879 | 4.789 | 3.454 | 11.123 | 11.392 | 0.976 |
| 01:15:01 PM | 424.5 | 434.1 | 425.3 | 11.88 | 19.96 | 14.64 | 2.872 | 4.775 | 3.594 | 11.24  | 11.508 | 0.977 |
| 01:15:11 PM | 425.2 | 434.2 | 425.7 | 11.87 | 19.99 | 14.05 | 2.875 | 4.786 | 3.447 | 11.108 | 11.375 | 0.977 |
| 01:15:21 PM | 424.7 | 433.8 | 425.3 | 11.86 | 19.91 | 14.02 | 2.869 | 4.763 | 3.439 | 11.071 | 11.336 | 0.977 |
| 01:15:31 PM | 424.8 | 433.9 | 425.2 | 11.86 | 19.95 | 14.64 | 2.869 | 4.774 | 3.591 | 11.235 | 11.499 | 0.977 |
| 01:15:41 PM | 424   | 433.4 | 424.7 | 11.85 | 19.89 | 14.02 | 2.86  | 4.753 | 3.436 | 11.049 | 11.311 | 0.977 |
| 01:15:51 PM | 424.2 | 433.7 | 424.8 | 11.85 | 19.91 | 14.02 | 2.862 | 4.761 | 3.437 | 11.06  | 11.323 | 0.977 |
| 01:16:01 PM | 423.9 | 433.8 | 424.7 | 11.83 | 19.9  | 14.04 | 2.854 | 4.758 | 3.443 | 11.055 | 11.318 | 0.977 |
| 01:16:11 PM | 423.7 | 433.5 | 424.2 | 11.82 | 19.94 | 14.03 | 2.849 | 4.768 | 3.437 | 11.054 | 11.315 | 0.977 |
| 01:16:21 PM | 423.6 | 433.5 | 424   | 11.83 | 19.87 | 14.53 | 2.852 | 4.75  | 3.56  | 11.161 | 11.424 | 0.977 |
| 01:16:31 PM | 423.1 | 433   | 423.4 | 11.82 | 19.87 | 15.51 | 2.845 | 4.748 | 3.782 | 11.375 | 11.65  | 0.976 |
| 01:16:41 PM | 423   | 433.2 | 423.6 | 11.83 | 19.88 | 14.01 | 2.845 | 4.751 | 3.429 | 11.025 | 11.283 | 0.977 |
| 01:16:51 PM | 422.9 | 433   | 423.3 | 11.82 | 19.85 | 14.64 | 2.844 | 4.741 | 3.582 | 11.167 | 11.427 | 0.977 |
| 01:17:01 PM | 423   | 433.1 | 423.6 | 11.82 | 19.84 | 14.07 | 2.844 | 4.741 | 3.442 | 11.028 | 11.286 | 0.977 |
| 01:17:11 PM | 423.3 | 433.3 | 423.6 | 11.82 | 19.91 | 14.96 | 2.847 | 4.761 | 3.632 | 11.24  | 11.529 | 0.975 |
| 01:17:21 PM | 423.5 | 433.1 | 423.9 | 11.83 | 19.86 | 14.02 | 2.849 | 4.747 | 3.431 | 11.027 | 11.285 | 0.977 |



|              |                |                |                |               |               |               |              |              |              |               |               |              |
|--------------|----------------|----------------|----------------|---------------|---------------|---------------|--------------|--------------|--------------|---------------|---------------|--------------|
| 01:17:31 PM  | 424            | 431.9          | 424.4          | 11.85         | 19.79         | 14.05         | 2.866        | 4.713        | 3.442        | 11.021        | 11.271        | 0.978        |
| 01:17:41 PM  | 424            | 432            | 424.1          | 11.84         | 19.77         | 14.45         | 2.863        | 4.709        | 3.538        | 11.11         | 11.363        | 0.978        |
| 01:17:51 PM  | 424            | 431.8          | 424.1          | 11.85         | 19.75         | 15.26         | 2.867        | 4.702        | 3.706        | 11.274        | 11.559        | 0.975        |
| 01:18:01 PM  | 424.4          | 432.2          | 424.8          | 11.87         | 19.77         | 14.02         | 2.874        | 4.71         | 3.44         | 11.024        | 11.273        | 0.978        |
| 01:18:11 PM  | 423.5          | 432.2          | 424.6          | 11.87         | 19.8          | 14.68         | 2.869        | 4.714        | 3.602        | 11.184        | 11.434        | 0.978        |
| 01:18:21 PM  | 423.5          | 432.5          | 424.6          | 11.86         | 19.75         | 14.02         | 2.866        | 4.704        | 3.442        | 11.013        | 11.261        | 0.978        |
| 01:18:31 PM  | 423.4          | 432.3          | 424.4          | 11.86         | 19.72         | 14.04         | 2.864        | 4.697        | 3.444        | 11.005        | 11.251        | 0.978        |
| 01:18:41 PM  | 423.1          | 432.3          | 424.1          | 11.83         | 19.72         | 14.04         | 2.855        | 4.696        | 3.443        | 10.994        | 11.24         | 0.978        |
| 01:18:51 PM  | 424.1          | 432.1          | 424.7          | 11.86         | 19.74         | 14.05         | 2.87         | 4.705        | 3.445        | 11.02         | 11.267        | 0.978        |
| 01:19:01 PM  | 424.2          | 432.3          | 424.5          | 11.86         | 19.76         | 14.51         | 2.869        | 4.713        | 3.552        | 11.135        | 11.387        | 0.978        |
| 01:19:11 PM  | 424.3          | 431.9          | 424.4          | 11.86         | 19.8          | 14.04         | 2.87         | 4.723        | 3.439        | 11.032        | 11.276        | 0.978        |
| <b>Total</b> | <b>425.153</b> | <b>433.753</b> | <b>425.457</b> | <b>11.877</b> | <b>19.979</b> | <b>14.107</b> | <b>2.876</b> | <b>4.778</b> | <b>3.453</b> | <b>11.106</b> | <b>11.380</b> | <b>0.976</b> |

### Load Profile With Full Load & Pump

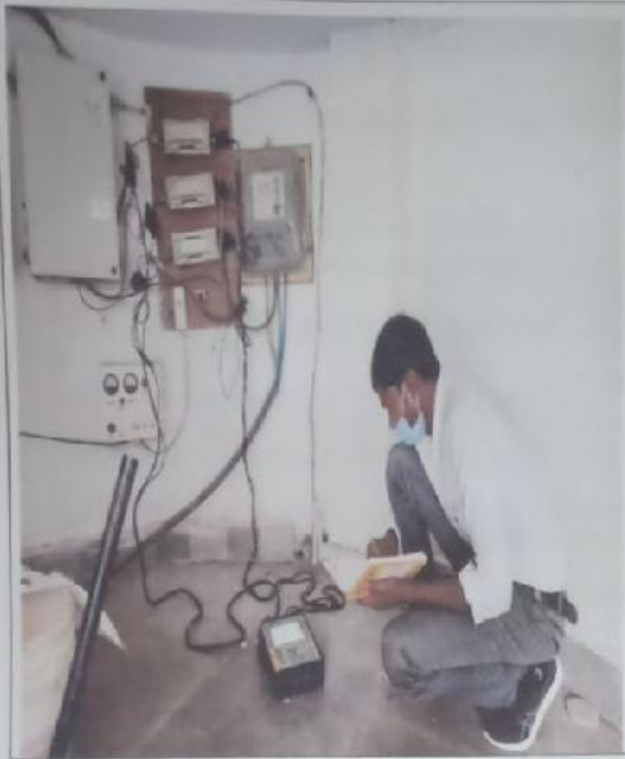
Date-24-08-2021

| Time:       | Voltage |         |         | Current |         |         | Load (KW) |         |         | Total Load |          | Power factor |
|-------------|---------|---------|---------|---------|---------|---------|-----------|---------|---------|------------|----------|--------------|
|             | R-phase | Y-phase | B-phase | R-phase | Y-phase | B-phase | R-phase   | Y-phase | B-phase | PT (KW)    | ST (KVA) | PFT          |
| 01:19:26 PM | 424.1   | 432.4   | 424.5   | 11.85   | 21.51   | 14.02   | 2.865     | 4.919   | 3.437   | 11.22      | 11.695   | 0.959        |
| 01:19:36 PM | 424     | 432.4   | 424.4   | 11.84   | 26.37   | 14.58   | 2.862     | 6.343   | 3.57    | 12.78      | 13.034   | 0.98         |
| 01:19:46 PM | 423.5   | 432     | 423.9   | 11.82   | 26.34   | 13.68   | 2.854     | 6.33    | 3.368   | 12.55      | 12.784   | 0.982        |
| 01:19:56 PM | 423.7   | 432.3   | 424.1   | 11.85   | 26.36   | 13.69   | 2.861     | 6.337   | 3.372   | 12.57      | 12.802   | 0.982        |
| 01:20:06 PM | 423.4   | 432.1   | 423.9   | 11.84   | 26.35   | 13.68   | 2.856     | 6.333   | 3.369   | 12.56      | 12.788   | 0.982        |
| 01:20:16 PM | 423.4   | 431.9   | 423.7   | 11.82   | 26.35   | 13.65   | 2.852     | 6.334   | 3.361   | 12.55      | 12.777   | 0.982        |
| 01:20:26 PM | 423     | 431.5   | 423.2   | 11.82   | 26.31   | 14.37   | 2.848     | 6.319   | 3.532   | 12.70      | 12.929   | 0.982        |
| 01:20:36 PM | 423.4   | 431.9   | 423.9   | 11.83   | 26.34   | 13.64   | 2.855     | 6.331   | 3.358   | 12.54      | 12.773   | 0.982        |
| 01:20:46 PM | 423.5   | 431.8   | 423.5   | 11.82   | 26.34   | 15.18   | 2.855     | 6.332   | 3.714   | 12.90      | 13.154   | 0.981        |

|              |                |                |                |               |               |               |              |              |              |               |               |              |
|--------------|----------------|----------------|----------------|---------------|---------------|---------------|--------------|--------------|--------------|---------------|---------------|--------------|
| 01:20:56 PM  | 423.4          | 431.7          | 423.8          | 11.83         | 26.33         | 13.68         | 2.856        | 6.324        | 3.366        | 12.55         | 12.774        | 0.982        |
| 01:21:06 PM  | 423.1          | 431.5          | 423.5          | 11.83         | 26.31         | 13.63         | 2.854        | 6.317        | 3.353        | 12.53         | 12.752        | 0.982        |
| 01:21:16 PM  | 423.2          | 431.1          | 423.4          | 11.83         | 26.33         | 14.25         | 2.855        | 6.321        | 3.502        | 12.68         | 12.905        | 0.982        |
| 01:21:26 PM  | 422.7          | 431.2          | 423            | 11.83         | 26.3          | 15.22         | 2.852        | 6.312        | 3.71         | 12.87         | 13.132        | 0.98         |
| 01:21:36 PM  | 423.4          | 431.6          | 423.6          | 11.83         | 26.32         | 14.25         | 2.857        | 6.325        | 3.504        | 12.69         | 12.915        | 0.982        |
| 01:21:46 PM  | 423.5          | 431.5          | 423.6          | 11.82         | 26.3          | 13.64         | 2.856        | 6.319        | 3.354        | 12.53         | 12.754        | 0.982        |
| 01:21:56 PM  | 424.3          | 432.1          | 424.3          | 11.83         | 26.36         | 13.66         | 2.862        | 6.34         | 3.363        | 12.57         | 12.795        | 0.982        |
| 01:22:06 PM  | 424.4          | 432.2          | 424.5          | 11.84         | 26.35         | 15.35         | 2.867        | 6.339        | 3.776        | 12.98         | 13.22         | 0.982        |
| 01:22:16 PM  | 423.8          | 431.7          | 424.1          | 11.82         | 26.3          | 13.63         | 2.856        | 6.32         | 3.355        | 12.53         | 12.758        | 0.982        |
| 01:22:26 PM  | 423.8          | 431.6          | 424            | 11.81         | 26.32         | 13.86         | 2.855        | 6.326        | 3.408        | 12.59         | 12.817        | 0.982        |
| 01:22:36 PM  | 423.8          | 431.8          | 424.2          | 11.83         | 26.31         | 14.41         | 2.859        | 6.326        | 3.545        | 12.73         | 12.961        | 0.982        |
| 01:22:46 PM  | 423.9          | 432            | 424.5          | 11.84         | 26.32         | 13.66         | 2.863        | 6.33         | 3.366        | 12.56         | 12.785        | 0.982        |
| 01:22:56 PM  | 423.2          | 430.8          | 423.3          | 11.82         | 26.25         | 15.31         | 2.854        | 6.304        | 3.755        | 12.91         | 13.144        | 0.982        |
| 01:23:06 PM  | 423            | 431.5          | 423.9          | 11.82         | 26.26         | 13.63         | 2.852        | 6.306        | 3.354        | 12.51         | 12.737        | 0.982        |
| 01:23:16 PM  | 423.2          | 431.4          | 424            | 11.83         | 26.26         | 13.66         | 2.859        | 6.307        | 3.361        | 12.53         | 12.749        | 0.983        |
| 01:23:26 PM  | 423.7          | 431.2          | 424.3          | 11.83         | 26.27         | 13.63         | 2.862        | 6.311        | 3.354        | 12.53         | 12.749        | 0.983        |
| 01:23:36 PM  | 423.5          | 431.4          | 424.2          | 11.83         | 26.26         | 13.63         | 2.86         | 6.309        | 3.356        | 12.53         | 12.746        | 0.983        |
| 01:23:46 PM  | 423.2          | 430.6          | 423.9          | 11.83         | 26.23         | 13.63         | 2.859        | 6.295        | 3.35         | 12.50         | 12.723        | 0.983        |
| 01:23:56 PM  | 423.5          | 430.6          | 424.1          | 11.81         | 26.24         | 13.83         | 2.857        | 6.299        | 3.396        | 12.55         | 12.776        | 0.983        |
| 01:24:06 PM  | 423.9          | 431.1          | 424.8          | 11.84         | 26.26         | 13.65         | 2.868        | 6.308        | 3.36         | 12.54         | 12.757        | 0.983        |
| 01:24:16 PM  | 424.3          | 430.6          | 424.5          | 11.85         | 26.25         | 13.63         | 2.871        | 6.306        | 3.35         | 12.53         | 12.747        | 0.983        |
| 01:24:26 PM  | 423.8          | 430.8          | 424.3          | 11.82         | 26.25         | 13.68         | 2.861        | 6.305        | 3.363        | 12.53         | 12.75         | 0.983        |
| 01:24:36 PM  | 424.4          | 431.3          | 424.9          | 11.84         | 26.26         | 13.6          | 2.869        | 6.313        | 3.347        | 12.53         | 12.752        | 0.983        |
| 01:24:46 PM  | 423.5          | 430.8          | 424.4          | 11.83         | 26.24         | 13.6          | 2.863        | 6.299        | 3.347        | 12.51         | 12.727        | 0.983        |
| 01:24:56 PM  | 424.2          | 431.5          | 425.3          | 11.84         | 26.29         | 13.67         | 2.87         | 6.321        | 3.369        | 12.56         | 12.782        | 0.983        |
| 01:25:06 PM  | 424.6          | 432.2          | 425.9          | 11.86         | 26.28         | 13.63         | 2.878        | 6.324        | 3.364        | 12.57         | 12.789        | 0.983        |
| 01:25:16 PM  | 424.2          | 432            | 425.5          | 11.84         | 26.28         | 13.61         | 2.87         | 6.323        | 3.358        | 12.55         | 12.772        | 0.983        |
| <b>Total</b> | <b>423.642</b> | <b>431.589</b> | <b>424.133</b> | <b>11.831</b> | <b>26.236</b> | <b>13.977</b> | <b>2.860</b> | <b>6.303</b> | <b>3.438</b> | <b>12.601</b> | <b>12.830</b> | <b>0.982</b> |

**Site Photograph**

**Annexure-2**



**Electrical Data Logging**



**Measuring Lux Level**



**Tubelight**



## BUREAU OF ENERGY EFFICIENCY

Examination Registration No.: ..... **EA-5514** .....  
Accreditation Registration No.: ..... **AEA-0295** .....



### Certificate of Accreditation

This is to certify that Mr./Ms. **Rakesh Khichariya** having its trade/registered office at **Bhilai** has been given accreditation as accredited energy auditor. The certificate shall be effective from **11<sup>th</sup>** day of **February, 2019**.

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. **0295** 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 **19<sup>th</sup>** day of **March, 2019**

  
Secretary,  
Bureau of Energy Efficiency  
New Delhi

Accreditation details can be check in the BEE official website (Check S.No. 257). Please click below link

<https://beeindia.gov.in/content/accredited-energy-auditors>



|     |          |                      |         |  |   |  |
|-----|----------|----------------------|---------|--|---|--|
| 257 | AEA-0297 | Mr Rakesh Khichariya | EA-5514 | Auditech Industrial Services Private Limited | Auditech Industrial Services Pvt. Ltd., Flat No - A/502, Haridra Bypass Street No - 3, Naraina Vihar, Kirti Road, District - Durg (C.G.) - 491022 | Contact: Mrs A.S. OPSCOM, Hotel Raza Saha, Raigarh |
|     |          |                      |         | Email :                                      | rajg1991@gmail.com<br>rakeshkhichariya@gmail.com  |  |
|     |          |                      |         | Office Number :                              |   |  |
|     |          |                      |         | Mobile Number :                              | 9827411444<br>9827411440  |  |

# 3. Environment Audit

**ENVIRONMENT AUDIT REPORT  
OF  
GOVT.COLLEGE KHERTHA, BALOD, CHHATTISGARH**



**ADDRESS:- KHERTHA BAZAR ROAD, KHERTHA  
CHHATTISGARH**

**KHERTHA, BALOD (C.G.) – 491771**



*Devi*  
**Principal,**  
Govt. College, Khertha  
Distt. Balod

**\* Environment Audit Report Prepared By \***

1. MR. YASER QURESHI

(M.Sc. Zoology, M.Phil)

Member DEAC ( District Environment Appraisal Committee)

Distt-Balod(C.G)

2. Mr. Umesh Pathak

(M.A. Geography)

3. Mrs. Devprabha Sahu

( M.Sc. Botany)

4. Mrs. Yamini Sahu

( M.Sc. Botany)

5. Mr. Manoj Sahu

( M.Sc. Chemistry)



Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

## 1.0. OBJECTIVES:

For environment audit following parameter is taken on pollution related status regarding air, water and noise at the Govt. college khertha on 28.06.2021 to be a part of environmental audit of the college.

## 2. A. WATER QUALITY MONITORING:

In order to assess the drinking water quality in Govt. college khertha, drinking water samples were collected from Bore well at Govt. college khertha on 28.06.2021 in a pre-cleaned one liter polythene bottle for the analysis of different physical and chemical parameters. The analysis was carried out in the laboratory of Govt. college khertha using the standard methods given in APHA, 2012(American Public Health Association).

## B. RESULTS:

The data table of the water sample at Govt. college khertha is shown in table-1.

**Table: 1:** Analytical Result of Drinking Water Samples Collected from Govt. college khertha.

| S. No. | Parameters                               | S-1   | Indian Standard for Drinking water |
|--------|--|-------|------------------------------------|
| 1.     | pH                                       | 6.75  | 6.5-8.5                            |
| 2.     | Conductivity ( $\mu\text{S}/\text{cm}$ ) | 219   | -                                  |
| 3.     | Turbidity (NTU)                          | 0.31  | 5                                  |
| 4.     | Total suspended solids (mg/l)            | 16    | -                                  |
| 5.     | Total dissolved solids (mg/l)            | 108   | 500                                |
| 6.     | Total hardness (mg/l)                    | 40.4  | 300                                |
| 7.     | Calcium (mg/l)                           | 11.65 | 75                                 |
| 8.     | Magnesium (mg/l)                         | 4.82  | 24.28                              |
| 9.     | Chlorides (mg/l)                         | 15.36 | 250                                |
| 10.    | Alkalinity (mg/l)                        | 27.57 | 200                                |
| 11.    | Iron (mg/l)                              | 0.11  | 0.3                                |
| 12.    | Arsenic (mg/l)                           | BDL   | 0.05                               |
| 13.    | Total Coli form (cfu/100ml)              | <1.8  | <1.8                               |


## C. OBSERVATION:

From the result table, it has been observed that, the analyzed values of the said drinking water sample are within the prescribed standards limit of CPCB (central pollution control board).

## 3. AIR QUALITY MONITORING:

The college is situated in outskirts of village khertha. It is far away from state highway and there is no industry or mining activity within periphery of 25km. So overall status of air quality is good here.



  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)



#### 4. A NOISE MONITORING:

College is situated in cool and calm surrounding. No industry or mining activity is operational in adjacent place; we don't feel noise pollution here. Instead we are blessed to here chirping sound of Birds.

#### B. OBSREVATIONS:

The noise monitoring was carried out at the 2 (two) locations in the college campus covering the main gate inside college and on top of college. Not observed any adverse or high noise which can impact environment.

#### 5. OVERALL CONCLUSION:

The water quality test conducted at the Khertha College revealed that the quality of water quality at the college campus is good with respect to the prescribed standard.

The monitoring of air quality is good and without any containments.

The noise level monitoring revealed that the noise level measured at different locations within tolerable limit.

#### 6. RECOMMENDATION:

To maintain the good environment, more green belt has to be developed in the college campus by planting valuable trees, fruits bearing plants and seasonal blooming trees etc which also helps to increase the beautification of the college.

#### Overall Conclusion:


The Air Quality, Water Quality and noise quality test conducted at the Govt. College Khertha revealed that the quality of Air and water quality at the college campus are good with respect to the prescribed standard.

The Noise level monitoring revealed that the noise level measured at different locations within the tolerable limit.

To maintain the good environment, more green belt has to be developed in the college campus by planting valuable trees, fruit bearing plants and seasonal blooming trees etc. which also helps to increase the beautification of the college.

Therefore it may be concluded that the Govt. college khertha Environment friendly college.



  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

# **4. Beyond the campus environmental promotion activities**

कार्यालय प्राचार्य, शासकीय महाविद्यालय खेरथा जिला-बालोद छ0ग0

क्रं 365/2017

खेरथा दिनांक 5/10/2017

प्रति

कुल सचिव  
दुर्ग विधि दुर्ग  
जिला दुर्ग छ0ग0।

विषय- स्वच्छता ही सेवा अभियान दिनांक 15 सितम्बर 2017 से 2 अक्टूबर 2017 को राका में।  
संदर्भ- आपका पत्र क्रं 245/2017 दुर्ग दिनांक 13/09/2017

संदर्भित पत्र के विषयान्तर्गत लख है कि उपरोक्तानुसार कार्यक्रमों का पालन प्रतिवेदन एवं फोटोवाक इत्यादि ईमेल आईडी0 youthvision.eg@gmail.com में आवश्यक कार्यवाही हेतु प्रेषित है।

(डॉ० आलोक मिश्रा)

प्राचार्य

शासकीय महाविद्यालय खेरथा  
जिला-बालोद छ0ग0

खेरथा दिनांक / / 2017

क्रं / 2017

प्रतिवेदिते-

- 1 राज्य एनएसएस अधिकारी व पदेन उपसचिव एवं शिक्षा विभाग मंत्रालय महानदी मन्च नया रायपुर।
- 2 जिला समन्वयक, रा0स0या0 दुर्ग विधि दुर्ग।

(डॉ० आलोक मिश्रा)

प्राचार्य

शासकीय महाविद्यालय खेरथा  
जिला-बालोद छ0ग0



*[Signature]*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)



*[Signature]*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

कार्यालय प्राचार्य, शासकीय महाविद्यालय खेरथा जिला-बालोद छ0ग0

क्रं 91/2018

खेरथा दिनांक 12/6/2018

प्रति,

कलेक्टर,  
जिला बालोद छ0ग0।

विषय- स्वच्छ भारत मिशन (ग्रामीण) अंतर्गत "Swachh Bharat Summer Internship"  
कार्यक्रम हेतु नोडल अधिकारी संबंधी।

संदर्भ- पेयजल एवं स्वच्छता मंत्रालय से प्राप्त पत्र क्रं 2/2//18 बालोद दिनांक 24/4/2018

उपरोक्त संदर्भित पत्र के विषयान्तर्गत शासकीय महाविद्यालय खेरथा जिला बालोद छ0ग0 महाविद्यालय से उपरोक्त "Swachh Bharat Summer Internship" कार्यक्रम हेतु निम्नानुसार नोडल अधिकारी नियुक्त किया जाता है।

1. श्री उमेश कुमार पाठक

मो0 नं0 9428663062

(डॉ० आलोक मिश्रा)

प्राचार्य

शासकीय महाविद्यालय खेरथा

जिला-बालोद छ0ग0

# शासकीय महाविद्यालय खेरथा

## राष्ट्रीय सेवा योजना

(कार्यक्रम प्रतिवेदन)

## “स्वच्छता ही सेवा” अभियान

दिनांक – 15 सितंबर से 02 अक्टूबर 2017

प्राचार्य/कार्यक्रम अधिकारी  
शासकीय महाविद्यालय खेरथा

:: ग्राम पंचायत स्तर पर श्रमदान दिवस का आयोजन ::

दिनांक – 22/09/2017

आज दिनांक को महाविद्यालय के समस्त स्टाफ एवं राष्ट्रीय सेवा योजना के स्वयंसेवकों व छात्र-छात्राओं के द्वारा ग्राम पंचायत स्तर पर श्रमदान दिवस का आयोजन किया गया। ग्राम स्तर पर घमण कर नलकूप, विद्यालय तथा बाजार के आसपास सफाई अभियान चलाया गया जिसमें ग्रामीण जनो की भी सक्रिय भागीदारी निभाई गई। स्वच्छता ही सेवा है इसी विषय पर चर्चा किया गया तथा गॉव में सभी स्थानों पर निरंतर सफाई व्यवस्था बनाये रखने का प्रण लिया गया।



*Ramesh*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

:: स्वच्छता नारा लेखन ::

दिनांक - 23/09/2017

स्वच्छता ही सेवा अभियान के अंतर्गत आज दिनांक को छात्र-छात्राओं दो टोली बनाकर नारा लेखन का कार्य किया गया। जिन विद्यार्थियों की लेखन शैली अच्छी थी ऐसे विद्यार्थियों का चयन कर रंग, ब्रश उपलब्ध कराकर स्वच्छता संबंधी नारे लिखे गए। ग्राम के विभिन्न मार्गों में ग्रामीणजनों की सहमति से उनके दिवारों में नारा लेखन का कार्य किया गया। ग्राम में स्वच्छता बनाये रखने हेतु सभी जनों को प्रेरित किया गया।

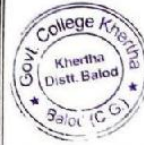
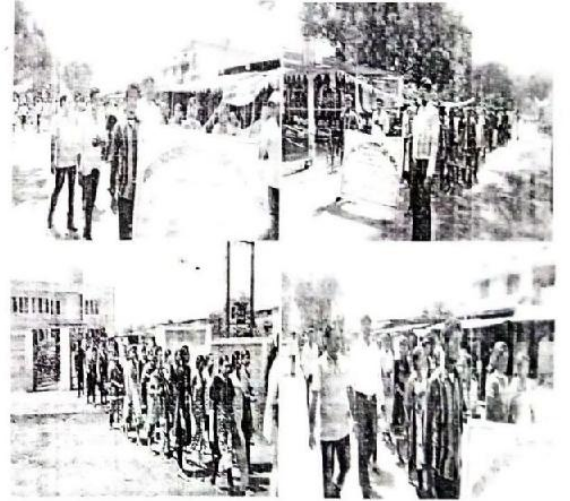


Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

:: स्वच्छता रैली का आयोजन ::

दिनांक - 23/09/2017

स्वच्छता ही सेवा अभियान के अंतर्गत आज दिनांक को राष्ट्रीय सेवा योजना के स्वयंसेवकों तथा छात्र-छात्राओं के द्वारा ग्राम भ्रमण के लिए रैली निकाली गई। सभी छात्र-छात्राओं के द्वारा ग्राम के प्रमुख मार्गों में रैली निकाली गई। इस दौरान स्वच्छता संबंधी नारे तथा गीत गाये गए। चौक-चौराहों में लोगों को एकत्रित कर स्वच्छता संबंधी संदेश दिये गए।

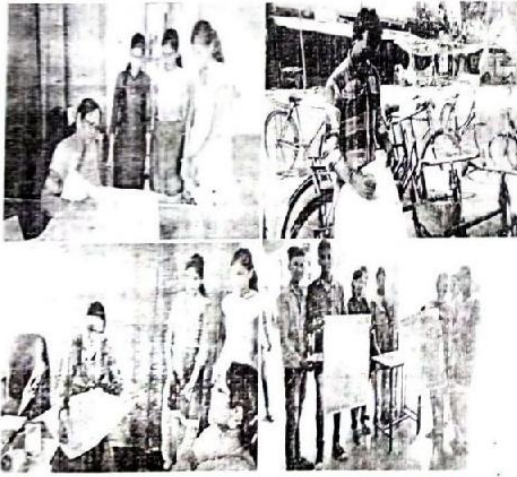


Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

:: सामुहिक स्वच्छता हस्ताक्षर अभियान ::

दिनांक - 26/09/2017

स्वच्छता ही सेवा अभियान के अंतर्गत आज दिनांक को स्वयंसेवकों तथा छात्र-छात्राओं के द्वारा महाविद्यालय परिसर में प्राचार्य महोदय, वरिष्ठ प्राध्यापिका, सहायक प्राध्यापक, समस्त स्टाफ तथा छात्र-छात्राओं से स्वच्छता के प्रति जागरूकता तथा इस अभियान को निरंतर सहयोग प्रदान करने के लिये हस्ताक्षर किये। हस्ताक्षर अभियान महाविद्यालय तथा ग्राम दोनों स्तर पर किया गया। छात्र-छात्राओं की दो टोली बनाकर लोगों को स्वच्छता के बारे में जानकारी देकर संकल्पित होकर हस्ताक्षर करने का आग्रह किया गया।



*Renuka*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

:: अस्वच्छता दहन दिवस का आयोजन ::

दिनांक - 02/10/2017

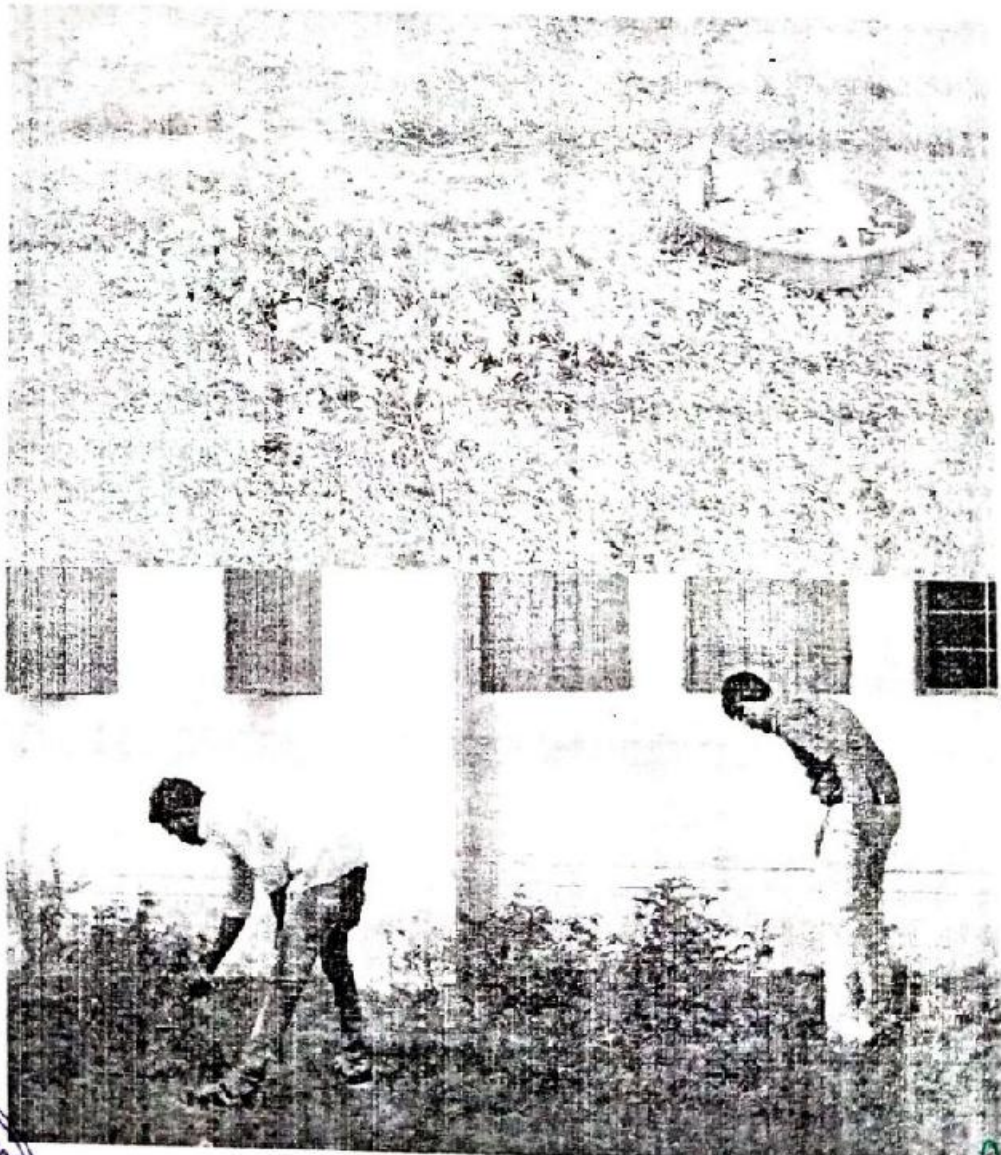
स्वच्छता ही सेवा अभियान के अंतर्गत आज दिनांक को महाविद्यालय स्तर पर प्राचार्य महोदय के निर्देशन तथा राष्ट्रीय सेवा योजना के कार्यक्रम अधिकारी के मार्गदर्शन में महाविद्यालय परिवार के सभी सदस्यों तथा छात्र-छात्राओं के द्वारा अस्वच्छता दहन कार्यक्रम किया गया। स्वच्छता ही सेवा अभियान के समापन अवसर पर महाविद्यालय परिसर में एकत्रित अस्वच्छता का दहन किया गया। समापन अवसर पर प्राचार्य महोदय द्वारा सभी छात्र-छात्राओं को संबोधित कर स्वच्छता ही सेवा अभियान संबंधी आग्रह किया गया तथा जीवन में स्वच्छता का महत्व बताकर राष्ट्रीय स्तर पर चल रहे अभियान में अपना-अपना सहयोग करने हेतु संकल्पित करवाया गया।



*Renuka*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

➤ शाला स्वच्छता कालखण्ड का आयोजन :-

स्वच्छता ही सेवा अभियान के शुभारंभ के पश्चात राष्ट्रीय सेवा योजना के अधिकारी, सहयोगी स्टाफ, स्वयंसेवकों और छात्र-छात्राओं के द्वारा स्वच्छता कालखंड का आयोजन किया गया। इसके अंतर्गत सभी कक्षाओं के छात्र-छात्राओं के द्वारा क्रमानुसार महाविद्यालय परिसर, कक्षाओं तथा मैदान की साफ-सफाई का कार्य किया गया। महाविद्यालय के मैदान में उगे हुए खरपतवारों की विशेष रूप से सफाई की गई। सभी छात्र-छात्राओं ने आगामी समय में इसी प्रकार निरंतर महाविद्यालय परिसर की सफाई बनाये रखने के लिए कार्य करने का वचन दिया गया।

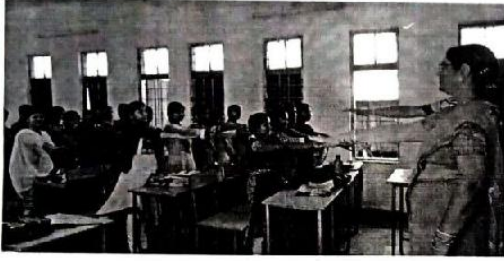


*Principal*  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

:: स्वच्छता पखवाड़ा का शुभारंभ ::

दिनांक - 02/08/2019

➤ स्वच्छता शपथ :- स्वच्छता पखवाड़ा 1 से 15 अगस्त के अंतर्गत आज दिनांक को महाविद्यालय स्तर पर प्राचार्य महोदय के मार्गदर्शन में महाविद्यालय परिवार के सभी सदस्यों तथा छात्र-छात्राओं के द्वारा स्वच्छता हेतु शपथ लिया गया। सभी सदस्यों तथा छात्र-छात्राओं ने स्वच्छता बनाये रखने तथा अपने आसपास के लोगों को भी इस हेतु प्रेरित करने का प्रण लिया गया। इसी शपथ अभियान के द्वारा स्वच्छता पखवाड़ा का शुभारंभ किया गया।



Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

:: स्वच्छता चर्चा एवं स्वच्छ संस्था की घोषणा ::

दिनांक - 15/08/2019

स्वच्छता पखवाड़ा के अंतर्गत आज दिनांक को महाविद्यालय स्तर पर प्राचार्य महोदय के निर्देशन तथा राष्ट्रीय सेवा योजना के कार्यक्रम अधिकारी के मार्गदर्शन में महाविद्यालय परिवार के सभी सदस्यों तथा छात्र-छात्राओं के द्वारा स्वच्छता संबंधी चर्चा किया गया। समापन अवसर पर प्राचार्य महोदय द्वारा सभी छात्र-छात्राओं को संबोधित कर स्वच्छता संबंधी आग्रह किया गया तथा जीवन में स्वच्छता का महत्व बताकर राष्ट्रीय स्तर पर चल रहे अभियान में अपना-अपना सहयोग करने हेतु संकल्पित करवाया गया तथा महाविद्यालय को स्वच्छ संस्था घोषित किया गया।

कार्यक्रम अधिकारी  
प्र.से.योजना  
कार्यक्रम अधिकारी  
स्वच्छता पखवाड़ा संस्था  
विना-करोद (उ.ग.)



प्राचार्य  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

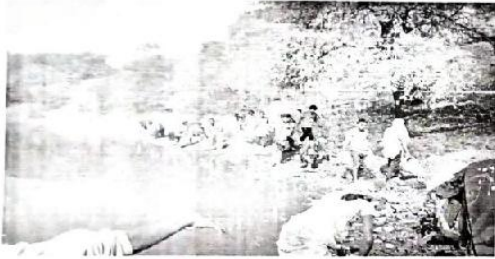
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)



:: गोद ग्राम स्तर पर स्वच्छता श्रमदान एवं जागरूकता ::

दिनांक - 6 से 10 अगस्त 2019

राष्ट्रीय सेवा योजना के स्वयंसेवकों व महाविद्यालय के अन्य छात्र-छात्राओं के द्वारा गोद ग्राम स्तर पर श्रमदान कार्यक्रम का आयोजन किया गया। ग्राम स्तर पर भ्रमण कर नलकूप, विद्यालय तथा बाजार के आसपास सफाई अभियान चलाया गया जिसमें ग्रामीण जनों की भी सक्रिय भागीदारी निर्माई गई। स्वच्छता का ही सेवा मानकर ग्राम तथा देश की सेवा करने का वचन लेकर उक्त विषय पर चर्चा किया गया तथा गाँव में सभी स्थानों पर निरंतर सफाई व्यवस्था बनाये रखने का प्रण लिया गया।



*Principals*  
Principal,  
Govt. College, Khertha  
Distt. Balod (G.G.)

> महाविद्यालय में स्वच्छता कालखण्ड का आयोजन :-

स्वच्छता पखवाड़ा शुभारंभ के पश्चात दिनांक 2 से 5 अगस्त तक राष्ट्रीय सेवा योजना के अधिकारी, सहयोगी स्टाफ, स्वयंसेवकों और छात्र-छात्राओं के द्वारा महाविद्यालय में प्रतिदिन स्वच्छता कालखंड का आयोजन किया गया। इसके अंतर्गत सभी कक्षाओं के छात्र-छात्राओं के द्वारा क्रमानुसार महाविद्यालय परिसर, कक्षाओं, प्रयोगशाला कक्षों तथा मैदान की साफ-सफाई का कार्य किया गया। महाविद्यालय के मैदान में उगे हुए खरपतवारों की विशेष रूप से सफाई की गई। सभी छात्र-छात्राओं ने आगामी समय में इसी प्रकार निरंतर महाविद्यालय परिसर की सफाई बनाये रखने के लिए कार्य करने का वचन दिया गया।



*Principals*  
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Govt. College, Khertha  
Distt. Balod (G.G.)



## कार्यालय प्राचार्य, शासकीय महाविद्यालय खेरथा, जिला - बालोद (छ.ग.)

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खेरथा, दिनांक 06/10/2020

// ग्रीन आर्मी //

पंजीकृत छात्र - छात्राओं की सूची

| क्रं. | नाम           | मोबाइल नं. | क्रं. | नाम          | मोबाइल नं. |
|-------|---------------|------------|-------|--------------|------------|
| 1     | कु. अम्बे     | 6268157871 | 19    | राजश्री      | 9407959102 |
| 2     | अंकिता        | 6264053854 | 20    | रूपा         | 7771044153 |
| 3     | धनेश्वरी      | 6268046920 | 21    | जितेन्द्र    | 6268128712 |
| 4     | चन्द्रकला     | 9669327065 | 22    | कामेन्द्र    | 9407908170 |
| 5     | चित्ररेखा     | 8719933936 | 23    | योगेन्द्र    | 7724858154 |
| 6     | दिव्या        | 9302057188 | 24    | गोपी राम     | 6232267349 |
| 7     | हूलसी देवांगन | 6268580960 | 25    | नितिश        | 6267803069 |
| 8     | जानकी साहू    | 9926833465 | 26    | हिरमेश       | 6268776083 |
| 9     | किर्ती        | 7772842636 | 27    | मीरा         | 6268055658 |
| 10    | चन्द्रिका     | 6268179838 | 28    | खोमलता       | 8224808836 |
| 11    | दामिनी        | 6267605203 | 29    | कोमल राम     | 8349071730 |
| 12    | जयन्ती        | 6268851138 | 30    | भोला राम     | 6268515980 |
| 13    | कविता         | 6268944420 | 31    | आषिश कुमार   | 7224931721 |
| 14    | अनिमा         | 9752295250 | 32    | चन्द्र कुमार | 9009930897 |
| 15    | बबिता         | 6268878731 | 33    | निखिल कटझरे  | 9340885296 |
| 16    | भूमिका        | 6268354688 | 34    | रुखमणी       | 6268887048 |
| 17    | किरण          | 6268764245 | 35    | गोदावरी      | 6265934079 |
| 18    | प्रतिभा       | 6268162634 | 36    | बीरझा        | 6264308823 |



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दिनांक 23/09/2019

महाविद्यालय के प्रभारी प्राचार्य श्री यासर कुरैशी के मार्गदर्शन में दिनांक 23/09/2019 को निम्नलिखित छात्र - छात्राओं को लेकर एक्वा क्लब /जलशक्ति अभियान टीम का गठन किया गया है। जिसके प्रभारी सहायक प्राध्यापक श्री उमेश पाठक (भूगोल विभाग) है।

## एक्वा क्लब सदस्यों के नाम

| क्रं. | नाम           | कक्षा               | मोबाइल नं   |
|-------|---------------|---------------------|-------------|
| 1     | पुजा          | बी.एस.सी. भाग - I   | 6260015563  |
| 2     | वंदना         | बी.एस.सी. भाग - I   | 6267928625  |
| 3     | सोहद्रा       | बी.एस.सी. भाग - I   | 9301908973  |
| 4     | हुलसी         | बी.एस.सी. भाग - III | 9179502566  |
| 5     | रोशन लाल      | बी.एस.सी. भाग - III | 8817741404  |
| 6     | पुष्पांजली    | बी.एस.सी. भाग - III | 9617076960  |
| 7     | रश्मि         | बी.एस.सी. भाग - III | 9617516187  |
| 8     | नमिता         | बी.एस.सी. भाग - III | 9617681595  |
| 9     | मंजू          | बी.एस.सी. भाग - III | 9630342800  |
| 10    | डामन लाल      | बी.एस.सी. भाग - III | 8719807379  |
| 11    | ओम कुमारी     | बी.एस.सी. भाग - III | 7746918210  |
| 12    | किरण प्रजापती | बी.एस.सी. भाग - III | 96447992753 |
| 13    | भूषण लाल      | बी.एस.सी. भाग - III | 7771965197  |

उक्त टीम water conservation से संबंधित कार्यों एवं गतिविधियों की मॉनिटरिंग करने के साथ - साथ समूह चर्चा एवं "singal use plastic" के उपयोग पर एवं इसके उपयोग के दुष्परिणाम के संबंध में जागरूकता की दि. 11 में कार्य करेगी।

श्री उमेश पाठक  
भूगोल विभाग

  
प्राचार्य

शासकीय महाविद्यालय, खेरथा  
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खेरथा, दिनांक 06/10/2020

// ग्रीन आर्मी //

पंजीकृत छात्र - छात्राओं की सूची

| क्रं. | नाम           | मोबाइल नं. | क्रं. | नाम          | मोबाइल नं. |
|-------|---------------|------------|-------|--------------|------------|
| 1     | कु. अम्बे     | 6268157871 | 19    | राजश्री      | 9407959102 |
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| 4     | चन्द्रकला     | 9669327065 | 22    | कामेन्द्र    | 9407908170 |
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| 7     | हूलसी देवांगन | 6268580960 | 25    | नितिश        | 6267803069 |
| 8     | जानकी साहू    | 9926833465 | 26    | हिरमेश       | 6268776083 |
| 9     | किर्ती        | 7772842636 | 27    | मीरा         | 6268055658 |
| 10    | चन्द्रिका     | 6268179838 | 28    | खोमलता       | 8224808836 |
| 11    | दामिनी        | 6267605203 | 29    | कोमल राम     | 8349071730 |
| 12    | जयन्ती        | 6268851138 | 30    | भोला राम     | 6268515980 |
| 13    | कविता         | 6268944420 | 31    | आषिश कुमार   | 7224931721 |
| 14    | अनिमा         | 9752295250 | 32    | चन्द्र कुमार | 9009930897 |
| 15    | बबिता         | 6268878731 | 33    | निखिल कटझरे  | 9340885296 |
| 16    | भूमिका        | 6268354688 | 34    | रुखमणी       | 6268887048 |
| 17    | किरण          | 6268764245 | 35    | गोदावरी      | 6265934079 |
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दिनांक 12/09/2016

// ग्रीन आर्मी //

## पंजीकृत छात्र - छात्राओं की सूची

| क्र. | नाम             | पिता का नाम    | क्र. | नाम             | पिता का नाम  |
|------|-----------------|----------------|------|-----------------|--------------|
| 1    | कु. मुनेश्वरी   | सुग्रीव राम    | 18   | कु. रीना        | दीनदयाल      |
| 2    | कु. हेमलता      | सहिस राम       | 19   | कु. धनेश्वरी    | रामचरण       |
| 3    | कु. मारती       | गैद सिंह       | 20   | कु. दामिनी      | रुखम लाल     |
| 4    | कु. वमेली       | उमैद सिंह      | 21   | कु. निकेता      | बिदेशराम     |
| 5    | कु. आरती        | पुरुषोत्तम लाल | 22   | कु. पार्वती     | जोहरीत       |
| 6    | कु. डिलेश्वरी   | नोहर दास       | 23   | कु. रश्मी       | हेन्त लाल    |
| 7    | कु. अजली        | शिव कुमार      | 24   | कु. वीणा        | भोजराम       |
| 8    | कु. अन्नपूर्णा  | दिलीप कुमार    | 25   | कु. युवती       | कार्तिक राम  |
| 9    | कु. दिपिका      | हेमलाल         | 26   | कु. जितेश्वरी   | दोमल लाल     |
| 10   | कु. कामिनी      | फूल सिंह       | 27   | कु. कमलेश्वरी   | भुवन         |
| 11   | कु. किरण        | बासुंग राम     | 28   | कु. तेजस्वी     | डोमार सिंह   |
| 12   | कु. लीना यदु    | दुलेश कुमार    | 29   | कु. वंदना       | बसंत कुमार   |
| 13   | कु. चंद्रसीमा   | तेजराम         | 30   | अनिल कुमार      | रोहित कुमार  |
| 14   | कु. चित्ररेखा   | टेकराम         | 31   | भुपेन्द्र कुमार | रामदुलार     |
| 15   | कु. हेमपुष्पा   | केशव राम       | 32   | चेतन दास        | कामता प्रसाद |
| 16   | कु. मनीषा       | युवराज         | 33   | जयराम           | गणेश राम     |
| 17   | कु. पुष्पा साहू | बिहारी लाल     | 34   | नीलकंठ          | यादव राम     |



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दिनांक 18/09/2017

// ग्रीन आर्मी //

## पंजीकृत छात्र - छात्राओं की सूची

| क्रं. | नाम             | कक्षा              | क्रं. | नाम             | कक्षा               |
|-------|-----------------|--------------------|-------|-----------------|---------------------|
| 1     | कु अनिता        | बी.ए. भाग - III    | 19    | कु. सारिका      | बी.एस.सी. भाग - II  |
| 2     | भुपेन्द्र कुमार | बी.ए. भाग - III    | 20    | कु. वेदिका      | बी.एस.सी. भाग - II  |
| 3     | डीकेश्वरी       | बी.ए. भाग - III    | 21    | विजय कुमार      | बी.एस.सी. भाग - II  |
| 4     | कु. डिलेश्वरी   | बी.ए. भाग - III    | 22    | आदित्य प्रजापति | बी.ए. भाग - II      |
| 5     | कु. आस्था       | बी.ए. भाग - I      | 23    | कु. चांदनी      | बी.ए. भाग - II      |
| 6     | अतुल कुमार      | बी.ए. भाग - I      | 24    | देवेन्द्र कुमार | बी.ए. भाग - II      |
| 7     | कु. दिव्या      | बी.ए. भाग - I      | 25    | खिलेश्वरी       | बी.ए. भाग - II      |
| 8     | कु ज्योति       | बी.ए. भाग - I      | 26    | कु. कविता       | बी.ए. भाग - II      |
| 9     | बेदेश्वरी       | बी.ए. भाग - I      | 27    | कु. आराधना      | बी.कॉम. भाग - II    |
| 10    | चंद्रकांत       | बी.ए. भाग - I      | 28    | कु. हिना        | बी.कॉम. भाग - II    |
| 11    | कु. धनेश्वरी    | बी.ए. भाग - I      | 29    | सुरज कुमार      | बी.कॉम. भाग - II    |
| 12    | कु. अमृत        | बी.एस.सी. भाग - II | 30    | कु. खोमेश्वरी   | बी.कॉम. भाग - II    |
| 13    | कु. चुनिता      | बी.एस.सी. भाग - II | 31    | कमलेश कुमार     | बी.एस.सी. भाग - III |
| 14    | कु. गितिका      | बी.एस.सी. भाग - II | 32    | कु. मनीषा       | बी.एस.सी. भाग - III |
| 15    | हितेश्वरी       | बी.एस.सी. भाग - II | 33    | कु. रीना        | बी.एस.सी. भाग - III |
| 16    | ईश्वरी          | बी.एस.सी. भाग - II | 34    | कु. पुष्पा साहू | बी.एस.सी. भाग - III |
| 17    | कुसुम           | बी.एस.सी. भाग - II | 35    | डामन लाल        | बी.एस.सी. भाग - II  |
| 18    | कु. किरण        | बी.एस.सी. भाग - II | 36    | गिरधर लाल       | बी.एस.सी. भाग - II  |



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दिनांक 27/08/2018

महाविद्यालय परिसर में हरियाली बनाये रखने एवं पहले से लगाये हुए पेड़ - पौधों के संरक्षण हेतु दिनांक 27/08/2018 को छात्र छात्राओं का एक समूह ग्रीन आर्मी के रूप में गठित किया गया है इस समूह में निम्न छात्र छात्राएं कार्य कर रही हैं :-

| क्रं. | छात्र छात्राओं का नाम | कक्षा               |
|-------|-----------------------|---------------------|
| 1     | कु. दिव्या            | बी.कॉम. भाग - I     |
| 2     | गुनीता                | बी.कॉम. भाग - I     |
| 3     | कु. आरती              | बी.ए. भाग - II      |
| 4     | कु. अंजु              | बी.ए. भाग - II      |
| 5     | अंजली                 | बी.ए. भाग - II      |
| 6     | कु. हेमलता            | बी.ए. भाग - II      |
| 7     | अनिता                 | बी.एस.सी. भाग - II  |
| 8     | अंकित कुमार           | बी.एस.सी. भाग - II  |
| 9     | डिलेश कुमार           | बी.एस.सी. भाग - II  |
| 10    | हिमांशू               | बी.एस.सी. भाग - II  |
| 11    | कु. चांदनी            | बी.ए. भाग - III     |
| 12    | कु. चमेली             | बी.ए. भाग - III     |
| 13    | कु. चंचल              | बी.एस.सी. भाग - III |
| 14    | कु. डामिन             | बी.एस.सी. भाग - III |
| 15    | कु. आराधना            | बी.कॉम. भाग - III   |
| 16    | चेतन दास              | बी.कॉम. भाग - III   |
| 17    | पुनेश कुमार           | बी.कॉम. भाग - III   |



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दिनांक 09/09/2019


// ग्रीन आर्मी //

पंजीकृत छात्र - छात्राओं की सूची

| क्रं. | छात्र छात्राओं का नाम | पिता का नाम | कक्षा               |
|-------|-----------------------|-------------|---------------------|
| 1     | ऐश्वर्य               | कौशल राम    | बी.एस.सी. भाग - I   |
| 2     | कु. भुनेश्वरी         | यादव राम    | बी.एस.सी. भाग - I   |
| 3     | डाकेश कुमार           | तोरन लाल    | बी.एस.सी. भाग - I   |
| 4     | इन्द्रजीत साहू        | पुहुप राम   | बी.एस.सी. भाग - I   |
| 5     | कु. भुमिका            | हेमलाल      | बी.कॉम. भाग - I     |
| 6     | भूपेश कुमार           | परदेशी राम  | बी.कॉम. भाग - I     |
| 7     | गायत्री               | हेमसिंह     | बी.कॉम. भाग - I     |
| 8     | कु. मोनिका            | सुखचंद      | बी.कॉम. भाग - I     |
| 9     | भारती                 | मंथाराम     | बी.एस.सी. भाग - II  |
| 10    | गोदावरी               | नोहरू       | बी.एस.सी. भाग - II  |
| 11    | गरुड साय              | दुर्गत साय  | बी.एस.सी. भाग - II  |
| 12    | प्रतिभा               | अंकालू राम  | बी.कॉम. भाग - II    |
| 13    | सुषमा                 | रामाधार     | बी.कॉम. भाग - II    |
| 14    | अंजु                  | मिथलेश      | बी.ए. भाग - III     |
| 15    | आरती                  | धरम सिंह    | बी.ए. भाग - III     |
| 16    | द्रोपती               | मिलाप सिंह  | बी.ए. भाग - III     |
| 17    | दीपिका                | अनिरुद्ध    | बी.एस.सी. भाग - III |
| 18    | गुनिता                | खेमलाल      | बी.एस.सी. भाग - III |
| 19    | गीतांजली              | भाभन लाल    | बी.एस.सी. भाग - III |
| 20    | हिमां जु              | रामरतन      | बी.एस.सी. भाग - III |
| 21    | कीर्ति                | सत्यवान     | बी.एस.सी. भाग - III |
| 22    | पेमिन                 | विजय कुमार  | बी.कॉम. भाग - II    |
| 23    | निलिमा                | लोकेश कुमार | बी.कॉम. भाग - II    |
| 24    | भिनेश्वरी             | भयाम लाल    | बी.एस.सी. भाग - I   |
| 25    | छबिला                 | हिरामन लाल  | बी.एस.सी. भाग - I   |



  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

  
प्राचार्य  
शासकीय महाविद्यालय, खेरथा  
जिला - बालोद (छ.ग.)



**(2) Policy Document on  
Environment and  
Energy usage**



**OFFICE OF THE PRINCIPAL**  
**Govt. College Khertha Distt. Balod (C.G.)**

email:- [govtcollegekhhertha491771@gmail.com](mailto:govtcollegekhhertha491771@gmail.com)  
[principal@govtcollegekhhertha.in](mailto:principal@govtcollegekhhertha.in)  
[govtcollege\\_khertha@rediffmail.com](mailto:govtcollege_khertha@rediffmail.com)

<http://www.govtcollegekhhertha.in>  
Landline no. +91 7748 299900  
mobile no. +91 9981426786

**Policy Document On Environment and Energy Usage**

The Environment and Energy usage Policy of Govt. College Khertha, is to manage energy in such a systematic way to minimize its impact on the environment. The policy implies exploring renewable energy resources to reduce the burden of the government and to find out substitute natural resources as solutions to the energy crisis. This environment and energy policy is binding for all the components of the institution and applies to all its stakeholders and the various activities undertaken by the institution. It will help us to embed efficiency and environmental awareness into our everyday activities, thus helping us to realize our responsibilities and commitment to the conservation of natural resources and to limit their usage. The college initiated different programs devoted to the cause of environmental awareness, to undertake green initiatives, and conduct green literacy programs to save energy and protect the environment.

**Policies:**

- To assess our energy usage and measure its impact on the environment.
- To count CO2 emissions generated by our means of transportations- vehicles.
- To reduce local air pollution emissions using environment-friendly vehicles, including bicycles, public transportation, and use of pedestrian-friendly roads.
- To install photovoltaic solar panels for the generation of alternate energy.
- To install LED bulbs in the complete campus to save energy.
- To develop a systematic waste management mechanism.
- To develop a rainwater harvesting unit.
- To undertake tree plantation drive.



*[Signature]* 1 | Page  
Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)



## OFFICE OF THE PRINCIPAL Govt. College Khertha Distt. Balod (C.G.)

email:- [govtcollegekhhertha491771@gmail.com](mailto:govtcollegekhhertha491771@gmail.com)  
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<http://www.govtcollegekhhertha.in>  
Landline no. +91 7748 299900  
mobile no. +91 9981426786

- To take additional measures to continuously improve our energy consumption.
- To develop and maintain an environmental management system.
- To encourage the use of advanced technology to minimize energy consumption, atmospheric emissions, and noise, particularly from different vehicles.
- To engage in dialogue with the government agencies, local bodies and the affiliating university and actively work with the local organizations in the areas of environment, energy efficiency and sustainable development.
- To monitor and respond to emerging environmental and energy issues.
- To strengthen our employees' and students' environmental knowledge and skills to improve our environmental performance. To provide information and training opportunities on energy-saving measures.
- To offer opportunities for employees and students to engage in initiatives that contribute to environmental protection.
- To train our employees and students through different activities regarding the environment

This policy will be communicated to the students and employees via internal communication channels and will be made available to all the stakeholders on the institutional website. The Environment and Energy Policy, objectives, and targets will be reviewed regularly by the college.



*Darshi*  
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Principal,  
Govt. College, Khertha  
Distt. Balod (C.G.)

**(3) Certificate from the  
Auditing Agency**

2021-22/ Khertha/ EA/ 01

Date: 13.12.2021

To,  
The Principal  
Govt. College Khertha

**Sub: Energy Audit Completion Letter**

**Ref No.: 131/2021, Dated: 19.08.2021**

Dear Sir,

With Reference to above, the audit team visited the College campus and Field Measurement done on 23.08.2021.

Also the final Energy Audit Report Submitted to the College.

This is for Your Perusal & record.

Thanks & Regards:



Aashish Bafna  
(Director)

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**Audittech Industrial Services Pvt. Ltd.**

Opps. Mahavir Bhawan, Tikarapara, Balod (C.G.)-491226

Email id – [aashishbbl@gmail.com](mailto:aashishbbl@gmail.com); [info@audittech.co.in](mailto:info@audittech.co.in), Contact no. -9827143100 / 8103651115



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# Certificate of Energy Auditor

## Energy Auditor Certificate

Reg No.: EA-28916

Certificate No.: 9780/19



# National Productivity Council

(National Certifying Agency)

## PROVISIONAL CERTIFICATE

This is to certify that Mr./Mrs./Ms. **AASHISH BAFNA**  
son / daughter of Mr. **ASHOK BAFNA**.....has passed the National certification Examination for Energy Auditors held in September 2018, conducted on behalf of the Bureau of Energy Efficiency, Ministry of Power, Government of India. He / She is qualified as **Certified Energy Manager** as well as **Certified Energy Auditor**.

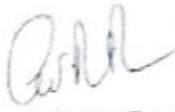
He/She shall be entitled to practice as Energy Auditor under the Energy Conservation Act 2001, subject to the fulfillment of qualifications for Accredited Energy Auditor and issuance of certificate of Accreditation by the Bureau of Energy Efficiency under the said Act.

This certificate is valid till the Bureau of Energy Efficiency issues an official certificate.

Digitally Signed by: K V R RAJU  
Mon Apr 22 16:23:39 IST 2019  
Controller of Examination, NPC AIP Chennai

Place : Chennai, India

Date : 22nd April, 2019

  
Controller of Examination