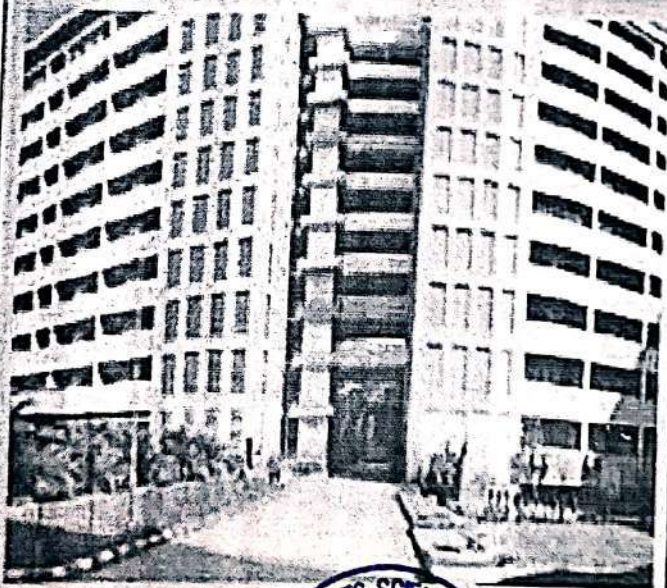
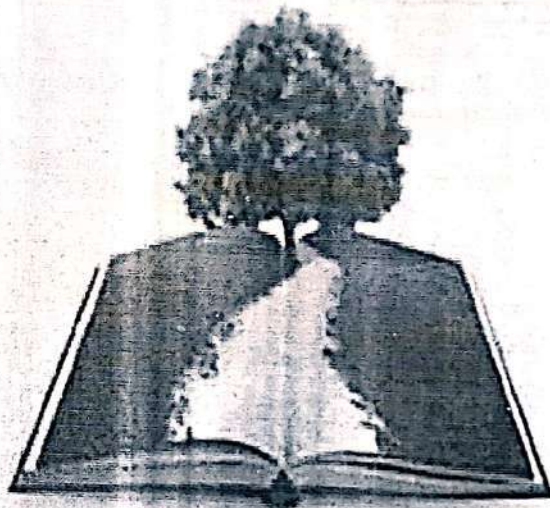




Mahatma Education Society's
Pillai HOCL Campus, Rasayani

Pillai

Green Audit Report



Presented By
RB ENERGY CONSULTANCY

Academic Year
2022-23



[Signature]
PRINCIPAL
Mahatma Education Society's
Pillai HOCL College of
Arts, Science & Commerce
Pillai HOCL Educational Campus
Rasayani, Taluka Khalapur
Tal. Rajgad, Pin- 410 207



GREEN AUDIT 2022-23



Green Audit Report of Mahatma Education Society's HOCL, Rasayani campus is conducted by RB Energy Consultancy Services and its team on 29th April and 2nd May 2023.

Green Audit report states the initiatives taken by institute towards environment





Green Audit Assessment Team (Internal)

Dr. Lata Menon, PhD (Economics), SET Principal, PHCAS
Dr. J. W. Bakal, Principal, Ph.D. Principal PHCET
Mr. Amar Mange MTech
Dr. Pradip P Chatterjee Ph.D. Principal PHIMSR
Ms. Suchita Sayaji B.Arch, M.Valuation Principal PHCA
Ms. Mamta A. Patil M.Com., M.Ed., NET Principal PHCER
Mr. Amrut Deshpande Professor, B.Arch, M.Arch
Ms. Sandhya Patil Associate Professor B.Arch, M.Arch
Ms. Renuka Wazalwa Associate Professor B.Arch, M.Arch
Ms. Meghana Sawant Associate Professor B.Arch, M.Arch
Mr. Binit Kumar
Ms. Remya Madan Gopal
Mr. Sujit Babu
Mr. Sumeet Mhatre
Mr. Shivraj Patil MTech Construction Management
Mr. Aniket Dumbre ME Mechanical
Mr. Jayesh Patil ME Computer
Ms. Pradnya Rane ME Construction Engineering & Management
Dr. Jaymin Shah Ph.D. (Management);
Prof. Vineet Murli MMS (Masters in Management Studies)
Prof. Sheena Nair MMS (Masters in Management Studies)
Ms. Reema Nikalje – M.A., M.Ed., NET
Ms. Angel Sunder – M.A., M.Ed.
Ms. Damanjit Kaur – M.Sc., M.Ed., NET
Dr. M.D. Nadar, Professor, Ph.D
Dr. Manvendra Vasistha, Professor, Ph.D
Dr. Gajendra Patil, Professor, Ph.D
Dr. Shilpa Kewate, Professor, Ph.D

(External)

RB Energy Consultancy
Certified Energy auditor (BEE), EA-7559-Certificate, 4541
info@electricalenergyaudit.in



Table of Content

| Sr. No. | Topic | Page No |
|---------|---|---------|
| 1 | Introduction | 5 |
| 2 | Geographical Location | 12 |
| 3 | Green Audit | 14 |
| 4 | 3.1 Natural Light Design | 14 |
| 5 | 3.2 Ventilation and Air Quality Design | 15 |
| 6 | 3.3 Water Conservation and Management | 17 |
| 7 | 3.4 Energy Use and Conservation | 19 |
| 8 | 3.4.1 Use of LPG and Natural Gas for Onsite Energy Generation | 22 |
| 9 | 3.4.2 Temperature and Acoustic Management | 23 |
| 10 | 3.5 Waste Management | 23 |
| 11 | 3.5.1 Sewage Water Management | 23 |
| 12 | 3.5.2 Paper Scrap Management | 24 |
| 13 | 3.5.3 Solid Waste Management | 25 |
| 14 | 3.5.4 Toxic Waste Management | 26 |
| 15 | 3.6 Building Maintenance | 26 |
| 16 | 3.7 Initiatives by Institute for Green Management | 27 |
| 17 | Annexure I: Campus Floor Plan | 29 |
| 18 | Annexure II: Diagram for Water Distribution | 39 |
| 19 | Annexure III: Details of Indoor Gardening | 40 |
| 20 | Annexure IV: List of Electrical Instruments in Energy intensive areas | 41 |
| 21 | Annexure V: Distribution of Equipments | 42 |
| 22 | Annexure VI: Checklist for Green Audit | 43 |



1. Introduction

"Beyond teaching, **mentoring.**

Beyond career-building, **character-building.**

Beyond institution-building, **nation-building.**

Because a nation **better taught,** is a nation **better empowered."**

Dr. K. M. Vasudevan Pillai

The Mahatma Education Society embarked upon its mission of "Education for all" with the Chembur English High School in the year 1970 by Mr. M. P Pillai and Dr. K. M. Vasudevan Pillai. The vision, dedication, global outlook, tenacious struggle and undaunted spirit of the Chairman and C.E.O., Dr. K. M. Vasudevan Pillai and the forward looking, untiring energy of the Secretary, Dr. Daphne Pillai has now transformed the Mahatma Education Society in to a vast educational organization, spread over six elegant campuses at Chembur, New Panvel (Sector 7), New Panvel (Sector 8), New Panvel (Sector 16), Borivali (Gorai) and Rasayani (Raigad District).

The Society now manages a total of 48 educational institutions providing quality education from kindergarten to Postgraduate professional courses in the faculties of Engineering, Architecture, Management, Teachers Training, Arts, Science and Commerce to more than 30,000 students with 2,000 Teachers and 1,500 members of Non-Teaching Staff. All institutions managed by Mahatma Education Society have excellent Professional Faculty, World Class Infrastructure, State-of-the art laboratories, well stocked libraries, computer centers with internet connectivity, separate hostels for boys and girls, cafeteria, gymkhana and playgrounds. Excellent results, 100% placement, interaction with the corporate world and global exposure are some of the special features of the institutions run by Mahatma Education Society. Popularly known as the Pillai Group of Institutions, this education major has its own teacher training institutes, which allow it to define its own standards and to achieve 100% results unflinchingly.

This Campus has the following institutions -

Pillai HOC College of Architecture (PHCA) (2010),

Pillai HOC College of Engineering and Technology (PHCET) (2009),

Pillai HOC Institute of Management Studies & Research (PHIMSR) (2009),

Pillai HOC College of Arts, Science and Commerce (PHCACS) (2008),

Pillai HOC College of Education and Research (PHCER) (2010).

The Campus has 4721 students enrolled and 365 teaching faculty and staff members on its payroll. The Colleges offer various courses listed below:



GREEN AUDIT 2022-23



Pillai HOC College of Architecture (PHCA)

- Bachelor of Architecture (B.Arch.)

Pillai HOC College of Engineering and Technology (PHCET)

- Diploma in Civil Engineering
- Diploma in Computer Engineering
- Diploma in Mechanical Engineering
- Bachelor of Civil Engineering
- Bachelor of Computer Engineering
- Bachelor of Electrical Engineering
- Bachelor of Electronics and Computer Science Engineering
- Bachelor of Information Technology
- Bachelor of Mechanical Engineering
- Master of Computer Engineering
- Master of Electronics and Telecommunication Engineering
- Master of Civil Engineering in Construction Engineering and Management
- Master of Mechanical Engineering in Machine Design
- Ph.D. in Computer Engineering
- Ph.D. in Civil Engineering

Pillai HOC Institute of Management Studies & Research (PHIMSR)

- Master of Management Studies (MMS)



GREEN AUDIT 2022-23



Pillai HOC Degree College of Arts, Science and Commerce (PHCACs)

- Bachelor of Commerce (B.Com. Regular)
- Bachelor of Commerce in Accounting & Finance (B.Com. A.F.)
- Bachelor of Management Studies (B.M.S.)
- Bachelor of Mass Media and Communication (B.M.M.C)
- Bachelor of Arts (B.A) (English Ancillary, History & Economics)
- Bachelor of Science in Computer Science (B.Sc. C.S.)
- Bachelor of Science (B. Sc.) (Physics, Chemistry & Mathematics)
- Bachelor of Science in Information Technology (B.Sc. I.T.)
- Bachelor of Science in Data Science
- Bachelor of Science in Hospitality Studies
- Masters of Commerce in Accountancy (M.Com.)
- Masters of Science in Information Technology (M.Sc. I.T.)
- Master of Science in Organic Chemistry

Pillai HOC College of Education and Research

- Bachelor of Education (B.Ed.) in English Medium



Campus Information

The Campus has interconnected buildings. Campus building has 9 floors. The floor wise layout is presented in **Annexure I**.

Floor wise Facilities of Campus

| PHEC " A " Building ARTS SCIENCE AND COMMERCE, MMS, B.Ed, Sports office | |
|--|--|
| Ground Floor | Gymnasium, Offices, sports room, store room classrooms, Washrooms, Water coolers (Ladies and Gents) |
| First Floor | Store room, xerox center, computer labs, Chemistry Lab, Physics labs, Language Lab Classrooms, Washrooms (Ladies and Gents) |
| Second Floor | Director Office, staff and HOD rooms, AV room, Classroom, Washroom (Ladies and Gents) |
| Third Floor | Library, Washroom (Ladies and Gents) |
| Fourth Floor | Classrooms, exam cell, washrooms (Gents and Ladies), IQAC Room, Research and Innovation Lab, Girls Common Room, Staff Room, Water Cooler |
| Fifth Floor | Classrooms, washrooms (Gents and Ladies), Boys Common Room, Water Cooler |
| Sixth Floor | Classrooms, washrooms (Gents and Ladies), Water Cooler, Staff Room (Gents and Ladies) |
| Seventh Floor | Staff Room, Classrooms, Washrooms (Ladies and Gents), Washrooms, water cooler (Ladies and Gents) |
| Eighth Floor | AV Room, Classrooms, Washrooms (Ladies and Gents), Washrooms (Ladies and Gents), Staff Room |
| Ninth Floor | Auditorium, Wash Rooms (Ladies and Gents) |
| PHEC " B " Building Central Admin, Architecture, Skill Development | |
| Ground Floor | RECEPTION, Chairman's Cabin, Dy CEO Cabin, Central Admin Office |
| First Floor | Principal Office, staff room, Computer Lab, Conference room, Washroom (Ladies and Gents) |
| Second Floor | Surveying Lab, Climatology Lab, Lecture Hall / Studio, Lecture Room, Washroom (Ladies and Gents) |



GREEN AUDIT 2022-23



| | |
|--------------|---|
| Third Floor | Exhibition, Jury Room, Multipurpose Hall, Library Washroom (Ladies and Gents) |
| Fourth Floor | Server room, Lecture room, Studio, Material Museum, Washroom (Ladies and Gents) |

| | |
|---------------|---|
| Fifth Floor | Electrical Lab, Plumbing Lab, Common room, Staff room, Studio Lecture Hall, Washroom (Ladies and Gents) |
| Sixth Floor | Lecture Room, Staff room, Studio Lecture Room, Washroom (Ladies and Gents) |
| Seventh Floor | Common room, Lecture room, Studio Lecture room, Washroom (Ladies and Gents) |
| Eighth Floor | Hostel Rooms, Ladies' and Gents' Toilets |
| Ninth Floor | Hostel Rooms, Ladies' and Gents' Toilets, and Auditorium |

PHEC " C " Building Hospitality, PHP

| | |
|---------------|--|
| Ground Floor | Restaurant, office washroom (Ladies and Gents) |
| First Floor | Kitchen, washroom Ladies and Gents |
| Second Floor | Eating Area |
| Third Floor | Classroom Staff room Washroom (Ladies and Gents) |
| Fourth Floor | Classroom Staff room Washroom (Ladies and Gents) |
| Fifth Floor | Classroom Staff room Washroom (Ladies and Gents) |
| Sixth Floor | Classroom Staff room Washroom (Ladies and Gents) |
| Seventh Floor | Library |

PHEC " D " Building Polytechnic

| | |
|--------------|---|
| Ground Floor | Work shop, automobile workshop, washroom (Ladies and Gents) |
| First Floor | Principle cabin, Chemistry lab |
| Second Floor | Classroom, wash rooms (Ladies and Gents) |
| Third Floor | Classroom, wash rooms (Ladies and Gents) |
| Fourth Floor | Classroom, wash rooms (Ladies and Gents) |
| Fifth Floor | Classroom, wash rooms (Ladies and Gents) |



GREEN AUDIT 2022-23



| PHEC " E " Building CONCLAVES / PHP | |
|--|--|
| Ground Floor | Stage with lawn |
| First Floor | Conclave, Washrooms (Ladies and Gents) |
| Second Floor | Conclave, Washrooms (Ladies and Gents) |
| | |
| Fourth Floor | Classrooms, Wash rooms (Ladies and Gents) |
| Fifth Floor | Staff room, Beauty parlor room, office, classroom, washroom (Ladies and Gents) |
| Sixth Floor | Classrooms, Wash rooms (Ladies and Gents) |
| Seventh Floor | Classrooms, Wash rooms (Ladies and Gents) |



GREEN AUDIT 2022-23



| | |
|--------------------------|---|
| Eighth Floor | Classrooms, Wash rooms (Ladies and Gents) |
| Floor PHCET / PHP | |
| Ground Floor | Workshops, Civil Engineering Labs, Mechanical Engineering Labs, Classrooms, Offices, Conference Room, Generator Shed (Power Station), Meter Room, Library, Audio Visual (AV) Room, Electrical Room, Dining Room, Canteen, Director's Cabin, Ladies' and Gents' Toilets, Machine Shops, Meter Room, Staff Room, and Enquiry Department |
| First Floor | Conference Hall, Director Cabin, Administrative Office, Ladies' and Gents' Toilets, Computer Engineering Lab, Faculty Room, IT Lab, ED Lab, Classrooms, Workshops, Computer Labs, Electronics Lab, Applied Science Lab, and Staff Room |
| Second Floor | Electronic Labs, Electronic & Telecommunication Labs, IT Labs, Library, Computer Centre, Mechanical Engineering Labs, Civil Engineering Lab, Classrooms, Computer Labs, Staff Rooms, HoD Room, and Ladies' and Gents' Toilets |
| Third Floor | Computer Labs, Library, Ladies' and Gents' Toilets, Electronics Lab, Classroom, Chemistry Lab, Physics Lab, HoD Room, and Staff Room |
| Fourth Floor | Classrooms, Store Room, Ladies' and Gents' Toilets, Seminar Room, |
| | Electronics Labs, Office Room, HOD Room, and Faculty Room |
| Fifth Floor | Seminar Rooms, Ladies' and Gents' Toilets, Electronics Lab, Classroom, Chemistry Lab, Staff Room, Office Rooms, and HoD Room |
| Sixth Floor | Classrooms, Ladies' and Gents' Toilets, Seminar Room, Conference Room, Electronic Labs, Staff Room, and Rooms of HoDs |
| Seventh Floor | Classrooms, Ladies' and Gents' Toilets, Seminar Room, Conference Room, Electronic Lab, Chemistry Lab, Staff Rooms |
| Eighth Floor | Hostel Rooms, Ladies' and Gents' Toilets |
| Ninth Floor | Hostel Rooms, Ladies' and Gents' Toilets, and Auditorium |



2. GEOGRAPHICAL LOCATION

Campus is established on 14.23 acres of lush green campus with more than 10,00,000 sq. ft of built-up area comprising spacious classrooms, well-equipped laboratories and workshops, new age computer facilities and a well-stocked library which provide a stimulating educational environment within the college. It is situated at a distance of about 4 kms from Rasayani Railway station. About 150m away from campus is Patalganga river which is situated at the back of the campus.



Pillai HOC Campus, Rasayani



Geographical Location of Pillai HOCL Campus, Rasayani



3. GREEN AUDIT

OBJECTIVES OF GREEN AUDIT

The main objectives of this green audit is to assess the environmental quality and the management strategies being implemented in Pillai HOC Campus Rasayani.

The specific objectives are:

1. To assess the quality of the water and air in Pillai HOC campus
2. To monitor the energy consumption pattern of the college
3. To quantify the liquid and solid waste generation and management plans in the campus.
4. To assess whether the measures implemented by Pillai HOC College have helped to reduce the Waste
5. To impart environment management plans to the college Green Audit
6. Providing suggestions for corrective actions and future plans.
7. To assess whether extracurricular activities of the Institution support the collection, recovery, reuse and recycling of solid wastes.
8. To identify the gap areas and suggest recommendations to improve the Green Campus status of the Pillai HOC Campus

METHODOLOGY

The audit was conducted in the campus with physical inspection of the campus, observations, review of documents and interviews with stakeholders.

Locations on the panels and other areas in the common areas of the building were visited and observations were made and images were clicked as a matter of proof. This report includes suggestions to improve upon the faulty areas and a guide to improve the systems further.

3.1 Natural Light Design

Observations:

Every area in the campus receives a good portion of daylight.

1. The open corridors with high ceilings receive good adequate daylight.



2. The library, classrooms and laboratory have high ceilings, large doors and windows for flow of air and light
3. Curtains are used for few windows to reduce glare
4. Staircase also receives a good amount of daylight.



Daylight at Staircase



Good Day Light in Library

Recommendations:

1. Few curtains need to be replaced

3.2 Ventilation and Air Quality Design

Trees play an important ecological role within the urban environment, as well as support improved public health and provide aesthetic benefits to cities. Trees contribute to their environment by providing oxygen, improving air quality, and climate amelioration. In one year, a single mature tree will absorb up to 48 pounds of carbon dioxide from the atmosphere, and release it as oxygen. The amount of oxygen released by the trees of the campus is good for the people in the campus. So while you are busy studying and working on earning those good grades, all the trees on campus are also working hard to make the air cleaner.

Observations:

1. The classrooms, laboratory, corridors are large enough to get adequate ventilation.
2. The classrooms and laboratory and library have large doors and windows for proper



ventilation.

3. Chemical laboratory in the campus has exhaust to remove pollutants, allergens, fumes, odors and unwanted moisture. Campus Canteen also has exhaust.
4. Air Conditioners are installed in few labs and auditorium
5. Campus has Green belts within the campus.
6. Fire alarm is installed on each floor.
7. Few indoor plants are planted within the campus. The details of these plants are given in **Annexure III**



Exhaust Fan in Chemical Laboratory and good ceiling height



Good Daylight in the Classroom



Trees around the Campus



Recommendations:

1. Exhaust to be cleaned and maintained.
2. Exhaust fans are installed only in the chemistry lab. More exhaust needs to be installed.
3. Only a few indoor plants were observed within the campus. Few artificial plants were observed in the campus that could be replaced by indoor plants.
4. Smoke detectors need to be installed.

3.3 Water Conservation and Management

Campus uses water supplied by MIDC-Maharashtra Industrial Development Corporation. Campus also uses bore well water and has sufficient water supply. The water quality is tested and approved by MIDC. Average consumption of water in the campus is 1865 KL/day. Total water consumption for 6 months October 2022 to March 2023 is 11190 KL. The figure below shows the consumption of water for 6 months.



Water Consumption in Campus from Oct 2022 to March 2023



Observations:

1. There are enough water storage facilities in the campus. MIDC water is stored underground and in overhead tanks.

| Storage type | Storage Quantity | Total Capacity |
|--------------|------------------|----------------|
| Underground | 07 | 810 KL. |
| Overhead | 23 | 1050 KL. |

2. The water is distributed from these tanks to various parts of campus. The distribution of water within the campus is diagrammatically represented in Annexure II.
3. Rainwater harvesting installation is the major step taken by college for water management. The water collected from the roof during the rainy season is collected in recharge pits and is used to recharge fire aquifers and tube wells. Part of water collected from rain harvesting is stored in underground storage tanks.
4. Water collected from tube wells and rainwater harvesting is used for flushing in toilets, gardening and fire water makeup.
5. Rainwater harvested by campus is approximately 18700 cm.
6. Drinking water facility is found to be efficient in the campus. Purifiers and water coolers are installed at every drinking water point.
7. Campus floors are cleaned and well maintained. Floors are cleaned and mopped daily.
8. Water saver faucets are installed in few washrooms
9. Water leakages are attended and maintained on time by inhouse team.
10. Signages are provided at a few water points.



Rainwater Harvesting System- Recharge Pit



Signages near Cooler/Purifier

Recommendations:

1. Water saver faucets need to be installed in every washroom.
2. Dual flushing should be provided in the washrooms to reduce 20% of water wastage.
3. Signages at every water supply point and washrooms required to emphasize on water conservation.
4. Water coolers which are not working need to be repaired
5. Water meters can be installed to quantify water consumption, depending on which proper measures can be taken to conserve more water.
6. Grey water or sewage recycled water should be used in toilets for flushing. This can reduce fresh water usage.
7. Awareness among students to conserve water campaigns has to be conducted.

3.4 Energy Use and Conservation

This audit deals with conservation of energy and methods to reduce the amount of use of energy. Major electric consumption is through electricity used, provided by MSEDCL-Maharashtra State Electricity Distribution Co.Ltd. The monthly average consumption of electricity from Feb 2022 to Jan 2023 is around 48634 KWh(units).



Monthly Energy Consumption from Feb 2022 to Jan 2023

Major electricity consumption are as follows

| Sl. No. | Equipments | Quantities |
|---------|--------------------------------|------------|
| 1 | CFL and Tube lights | 3895 |
| 2 | Light Emitting Diode-LEDs | 2148 |
| 3 | Fans | 2174 |
| 4 | Computers | 1259 |
| 5 | Air Conditioners | 125 |
| 6 | CCTV | 213 |
| 7 | Printers | 110 |
| 8 | Projectors | 48 |
| 9 | 1 phase machines | 21 |
| 10 | 3 phase machines | 54 |
| 11 | Refrigerators and deep freezer | 4 |
| 12 | Television | 6 |



Observations:

1. Every classroom and lab has a sufficient number of tube lights, LEDs and fans.
2. Air Conditioners used in campus are 1 star or 3 star. Few old ones have no stars.
3. UPS systems are provided to all computer equipped labs to prevent unexpected disruptions due to power cut.
4. All computers have LED screens. Signages are put on the wall to shut-down PCs when not in use.
5. Signages are also provided beside switch boards to switch OFF lights and fans when not in use to encourage users to save electricity.
6. Many of the conventional tube lights are replaced with LEDs.



Air Conditioners Installed in Lab



Signages near switch boards



First Aid Box



Recommendations:

1. Diagrams are recommended at every switch board to point the correct tube light and fan.
2. Old Air Conditioners without stars need to be replaced.
3. New electronic devices while purchasing should have star ratings as per BEE (Bureau of Energy Efficiency).
4. Light reflectors should be used so that the light is spread to large area and also reduces electricity consumption
5. Control sensors can be used to dim the light automatically when people are not around.
6. Emergency Exit Signage is required

3.4.1 Use of LPG and Natural Gas-Onsite Energy Generation:

Observations:

1. LPG gas are used in canteen for cooking
2. 2 diesel generators of 250 KVA for backup have been installed for emergency power failure.
3. Renewable energy is used by Solar panels of 10 KWP installed on rooftops. This energy is used for street lights within the campus.



2 Diesel Generators



Solar Panels



3.4.2 Temperature and Aconstic Management

1. Since the campus is in the midst of the HOC colony, it is far from noise pollution.
2. The trees planted in the campus helps in reducing temperature and also reduces noise pollution.
3. Maintenance free tiles used on the walls of the building not only reduces the cost of the building but also reduces the temperature within the building.
4. Conclaves and auditoriums have acoustic control walls.



Green Belt within the campus



Maintenance Free tiles on the building

3.5 Waste Management

Human activities create a lot of hazardous wastes, Waste management audit checks the ways these wastes are dealt with. Wastes paper wastes, solid wastes, plastic wastes and also e-wastes.

3.5.1 Sewage Water Management

Waste water is generally generated from toilets, washrooms and canteen. There are 146 washrooms in the campus.

Observations

1. Waste water generated from toilets, canteen and laboratories are connected to sewerage system provided by MIDC



Recommendations:

1. Sewage treatment plant to be installed in the campus.

3.5.2 Paper Scrap Management

Waste paper is the main waste generated since it is an academic institution. Campus has taken many steps to reduce these wastes.

Observations:

1. Most of the documents are maintained online.
2. Both sides of the paper are used while printing and taking photocopies.
3. There are more than 7000 e-books made available online for students and staff.
4. Notices are made available on the websites and also put on the notice board.
5. Internal communications are done through intercoms, mails, messages and whatsapp.
6. Old submissions, papers after 3-4 years as per University norms are archived stored in the storage room at the ground floor.
7. The old papers are exchanged with new papers from scrap dealers.



Notice Board



Library

Recommendations:

1. Campus can opt for a student portal for putting up notices, submission of write ups and assignments.



2. Paper usage should be monitored, depending on which some digitization can be brought up to reduce paper wastages.
3. Separate waste collection bins required at every corner which are found placed only in the canteen.

3.5.3 Solid Waste Management

Observations:

1. Separate bins for wet and dry waste are found in the canteen.
2. Almost 50 kgs of dry and wet waste is generated by the canteen.
3. Campus has installed a composting unit to deal with these wastes.
4. In other areas like classrooms, staff rooms or offices mostly paper waste or plastic wastes are generated.
5. Dust bins are found in every corner of every classroom.
6. Signages were found near a few dustbins.





Recommendations:

1. Separate bins to segregate waste should be provided as provided in the canteen.
2. Plastic bottles should be given for recycling
3. Signages should be provided at every point of collection.

3.5.4 Toxic waste Management

Observations:

1. The campus is almost digitized to a large extent. It has computer enabled classrooms, AV rooms, biometric attendance system, students and staff portal. All these facilities lead to reduction in wastage.
2. Old electronic devices are given to dealers under a buy back policy.
3. Campus has a component library where the old systems are dismantled and the usable parts are stored in the library, which can be used by students if required for their project.

3.6 Building Maintenance

Observations:

1. Building is covered with maintenance free tiles. No leakages were found and were maintained.
2. Campus is easily accessible from the main road.
3. Campus has 11 staircases and 13 elevators.
4. Staircases are 2 feet wide and uncluttered, so can be used for emergency exit during an emergency
5. Fire extinguishers and fire hydrants are provided near the staircase and elevators.

Recommendations:

1. Signages required near every emergency fire exit point, required during an emergency.
2. Hand rails should be provided to every staircase to avoid falling during an emergency.
3. Few fire extinguishers required to be serviced.
4. Fire safety management training programs should be conducted annually.



3.7 Initiatives by Institute for Green Management

Observations:

1. Campus has come up with many green initiatives.
2. Environment Management is included in the curriculum to increase awareness.
3. Nature Club organizes different events to increase green awareness among students throughout the year
4. NSS and Nature Club have started a "Know Green, Think Green" promotion.
5. Campus has installed rain water harvesting system
6. Campus has installed 2 composting units for solid waste management.
7. Campus has solar panels to reduce energy consumed
8. Campus has taken a great initiative of component library under e-waste management
9. Awareness programs for canteen staff are conducted to keep the dry and wet waste separated.
10. Sprinklers and drip systems are used to water the garden area which saves water.
11. "Zero Garbage Initiative" program was started in the campus to increase awareness about solid waste.



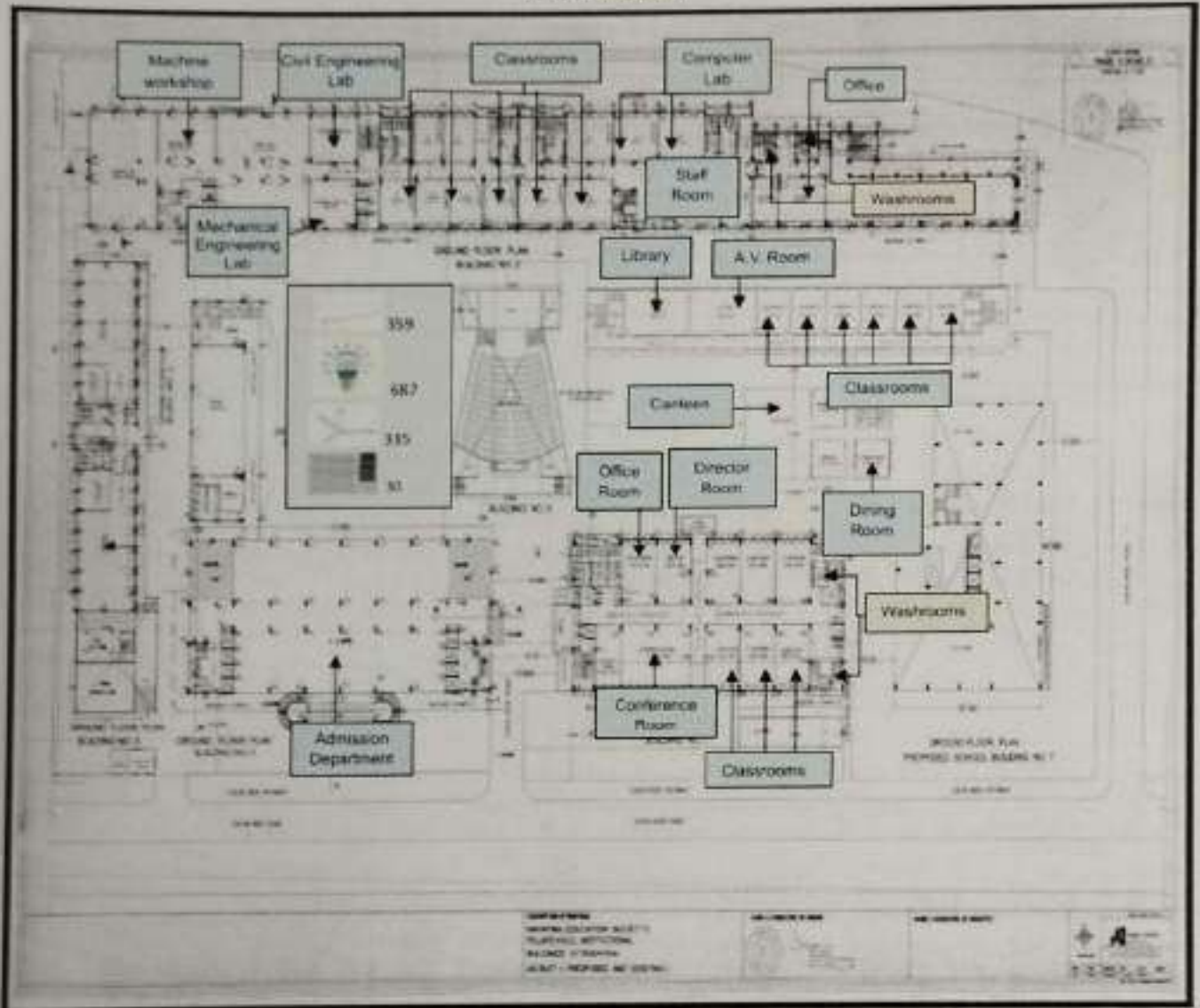
Recommendations:

1. Vertical gardening on campus walls is recommended using indoor plants.
2. More webinars, workshops and outdoor activity can be initiated to increase the awareness.
3. Renovation of the cooking system in the canteen to save gas.
4. Establish a purchase policy that is energy saving and eco-friendly.
5. Replace incandescent and CFL lamps with LED lights.
6. Avoid plastic/thermocool plates and cups in the college level or department level functions.
7. Introduce add-on courses eco-friendly income generating to all interested students.



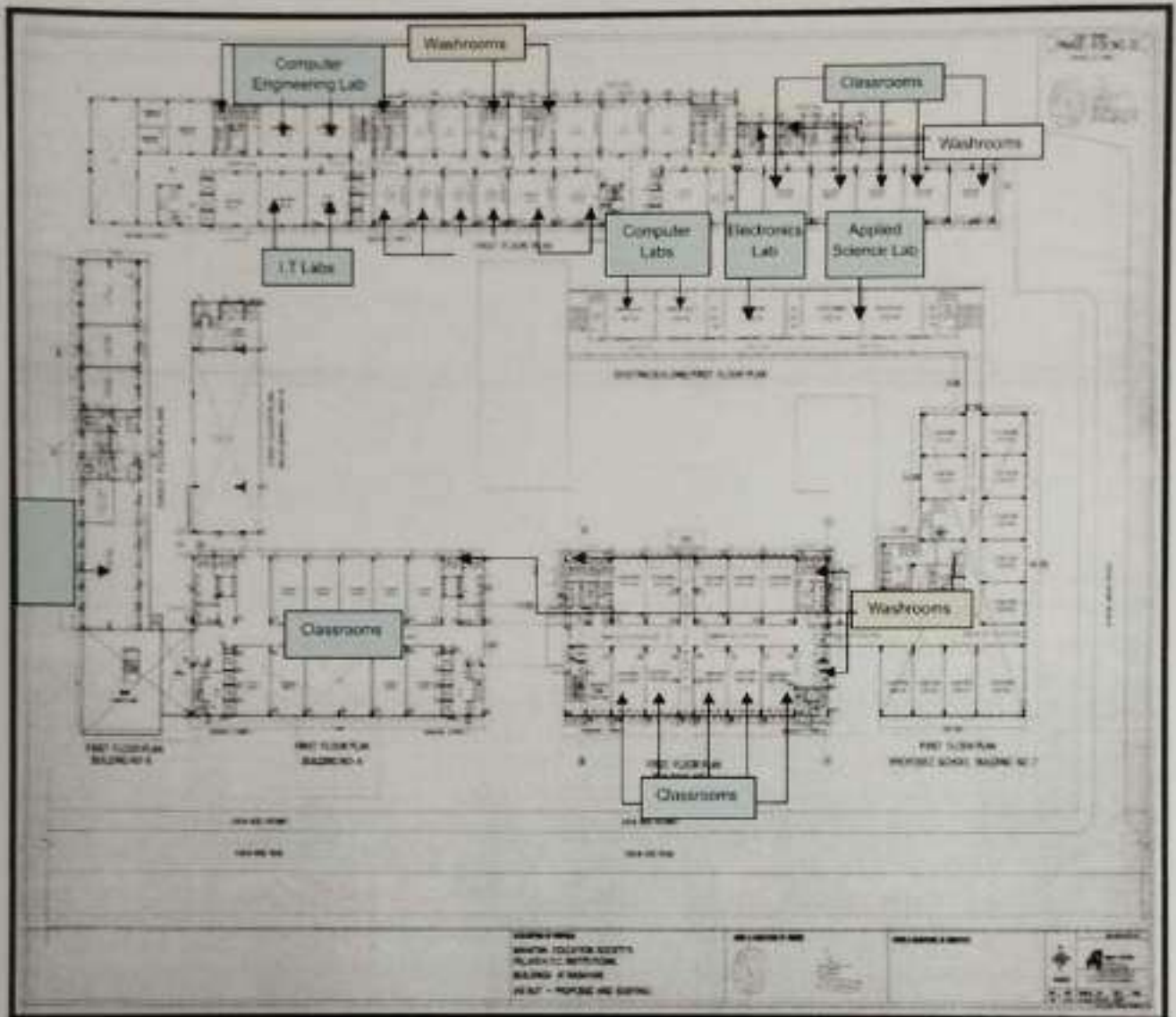
ANNEXURE 1: CAMPUS FLOOR PLAN

Ground Floor





First Floor

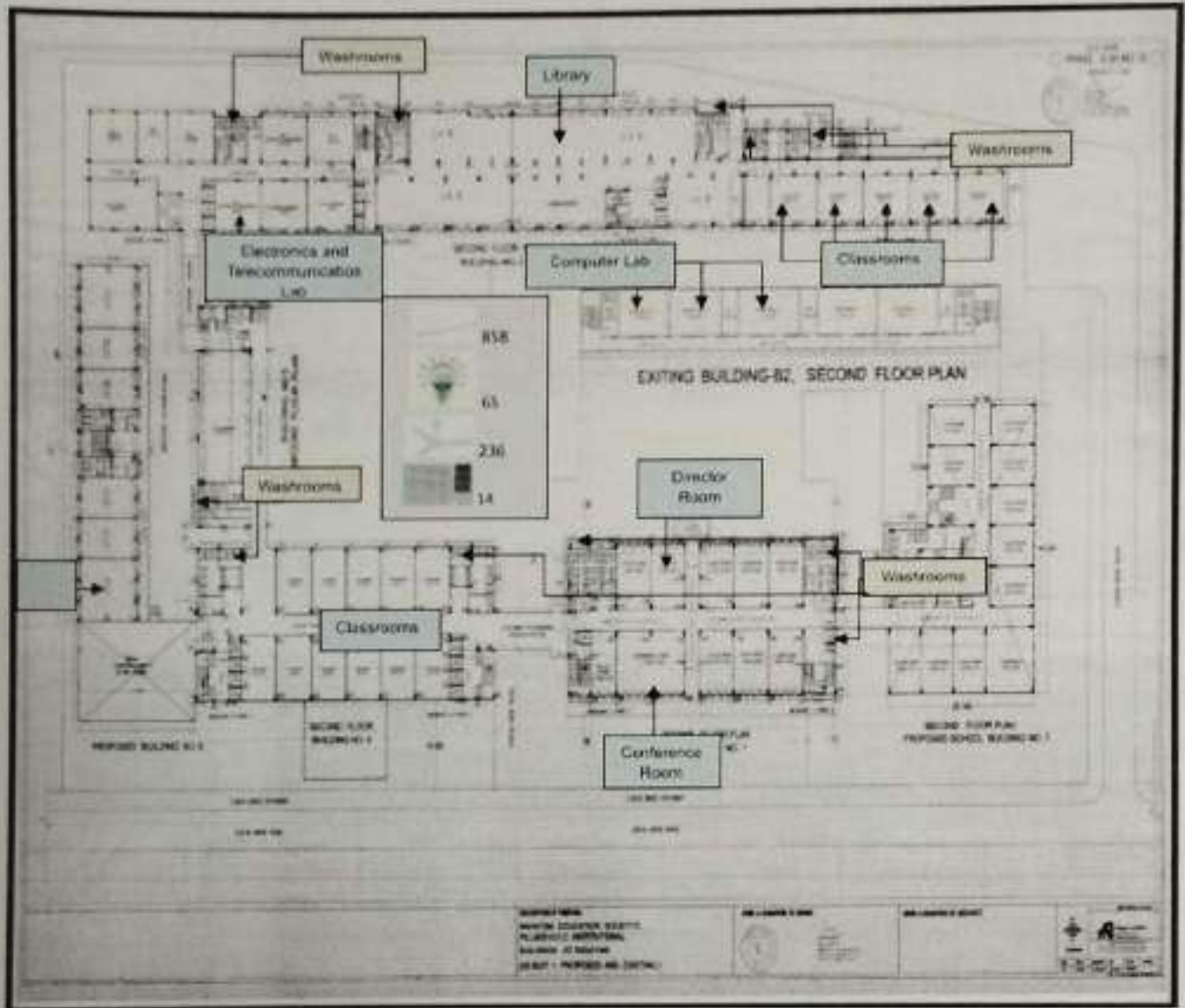




GREEN AUDIT 2022-23

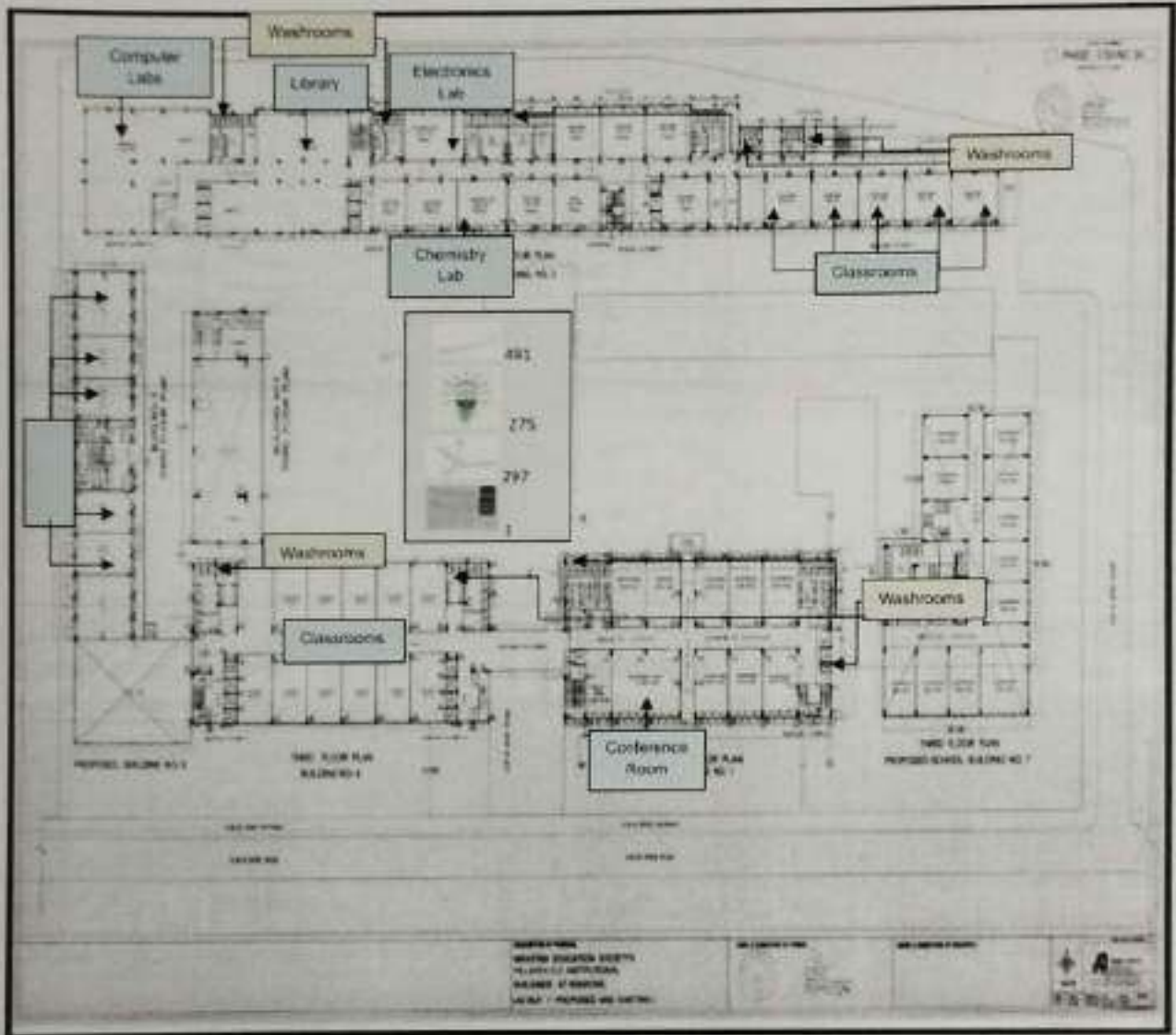


Second Floor



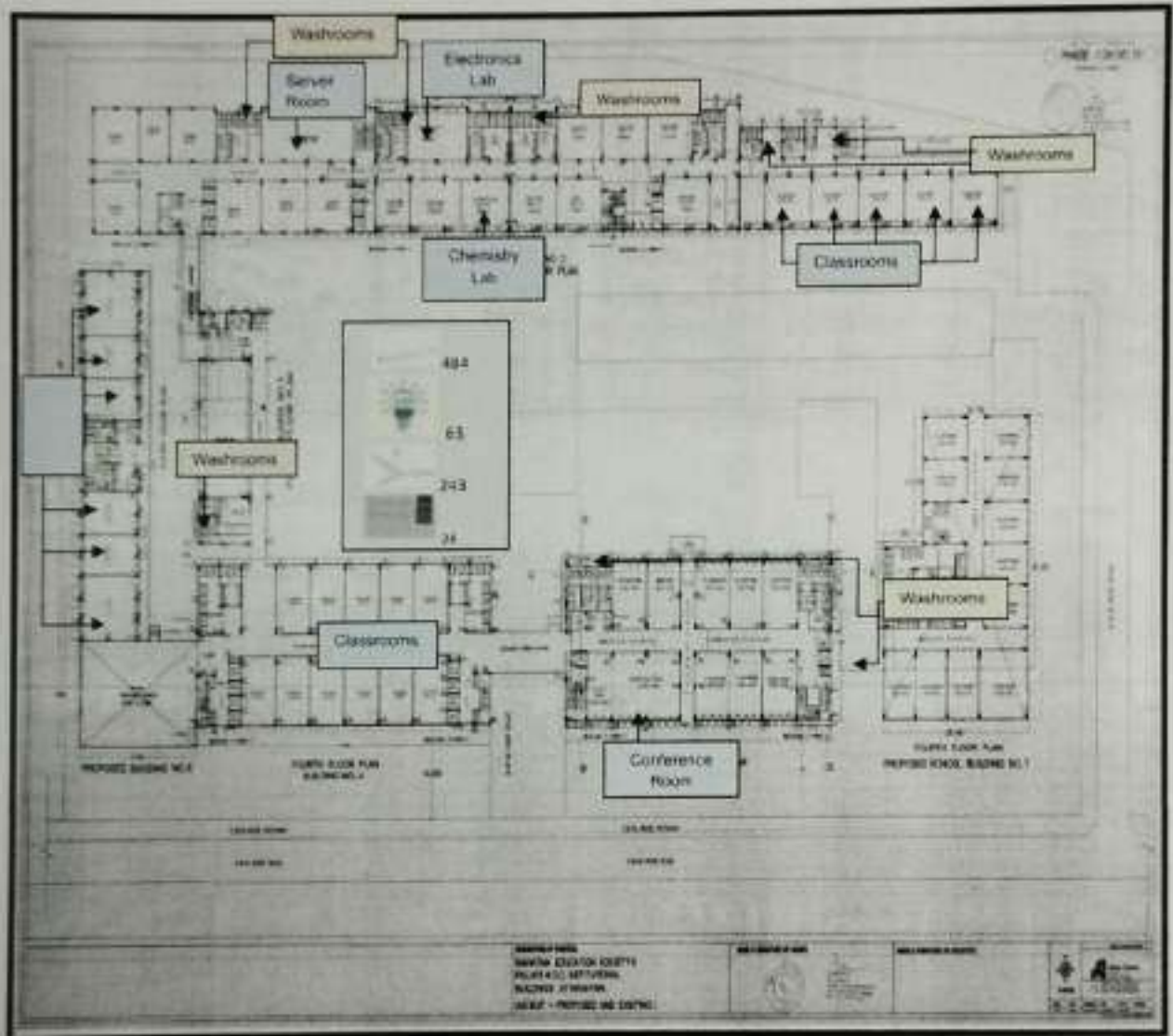


Third Floor



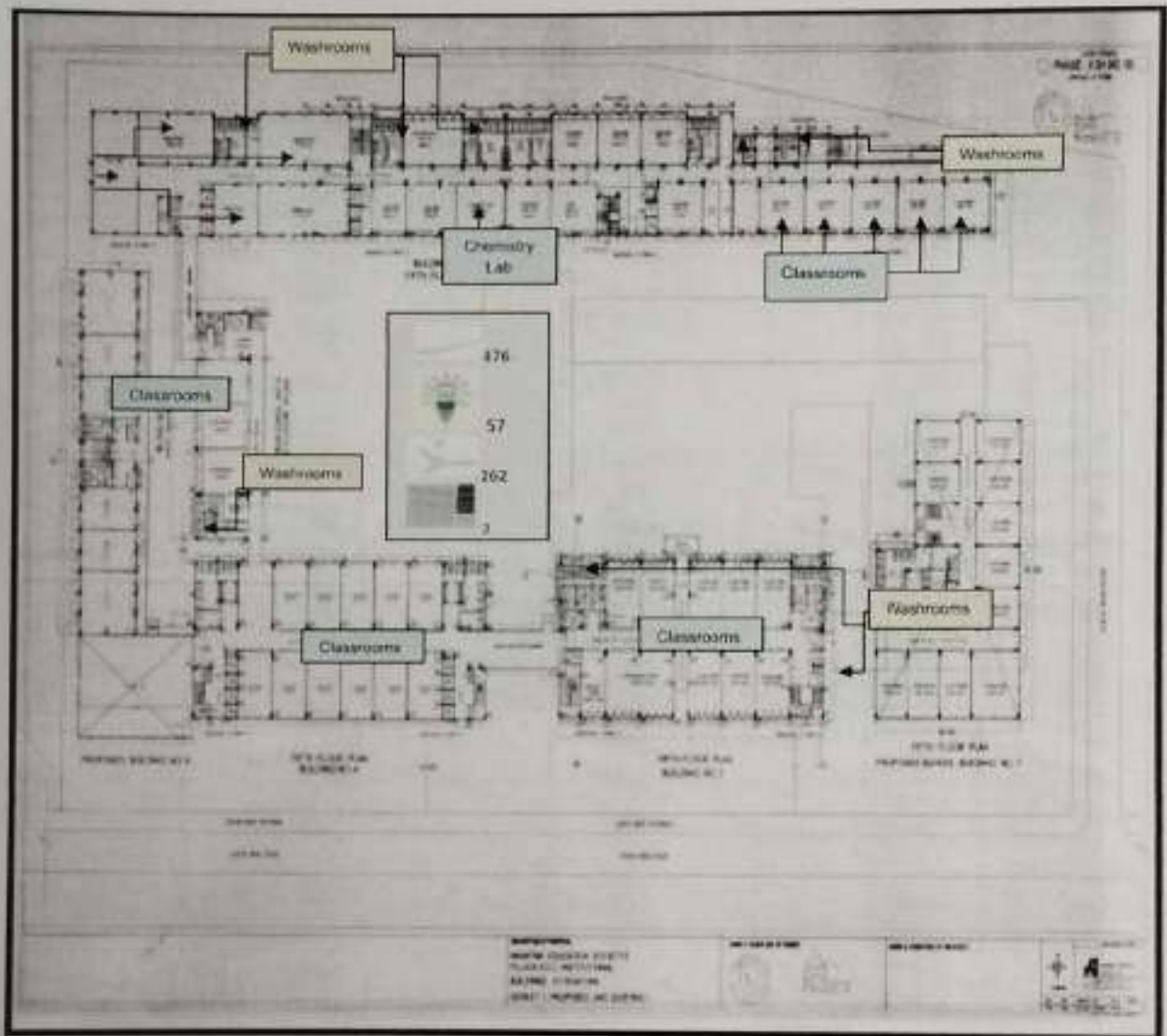


Fourth Floor



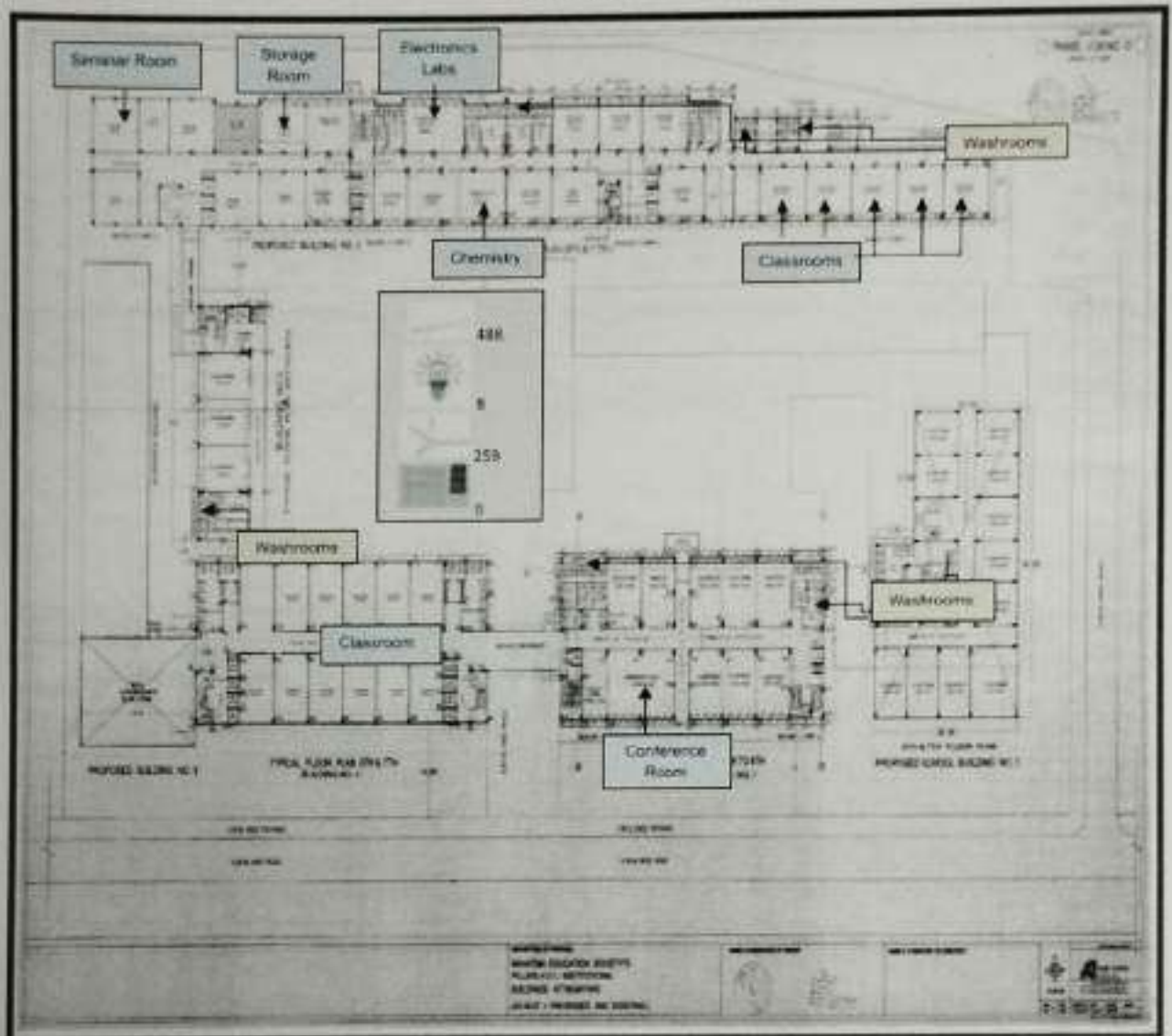


Fifth Floor



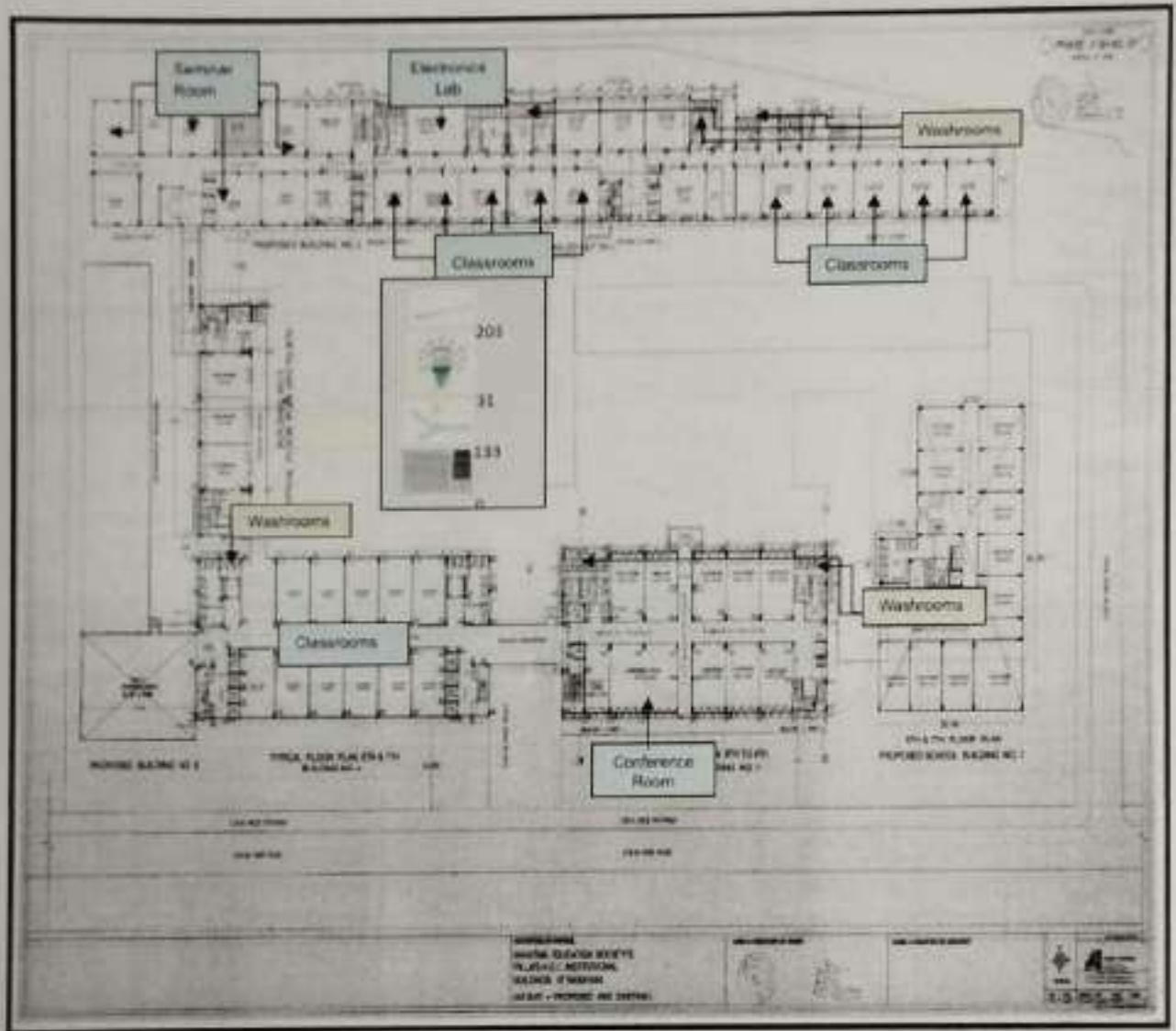


Sixth Floor



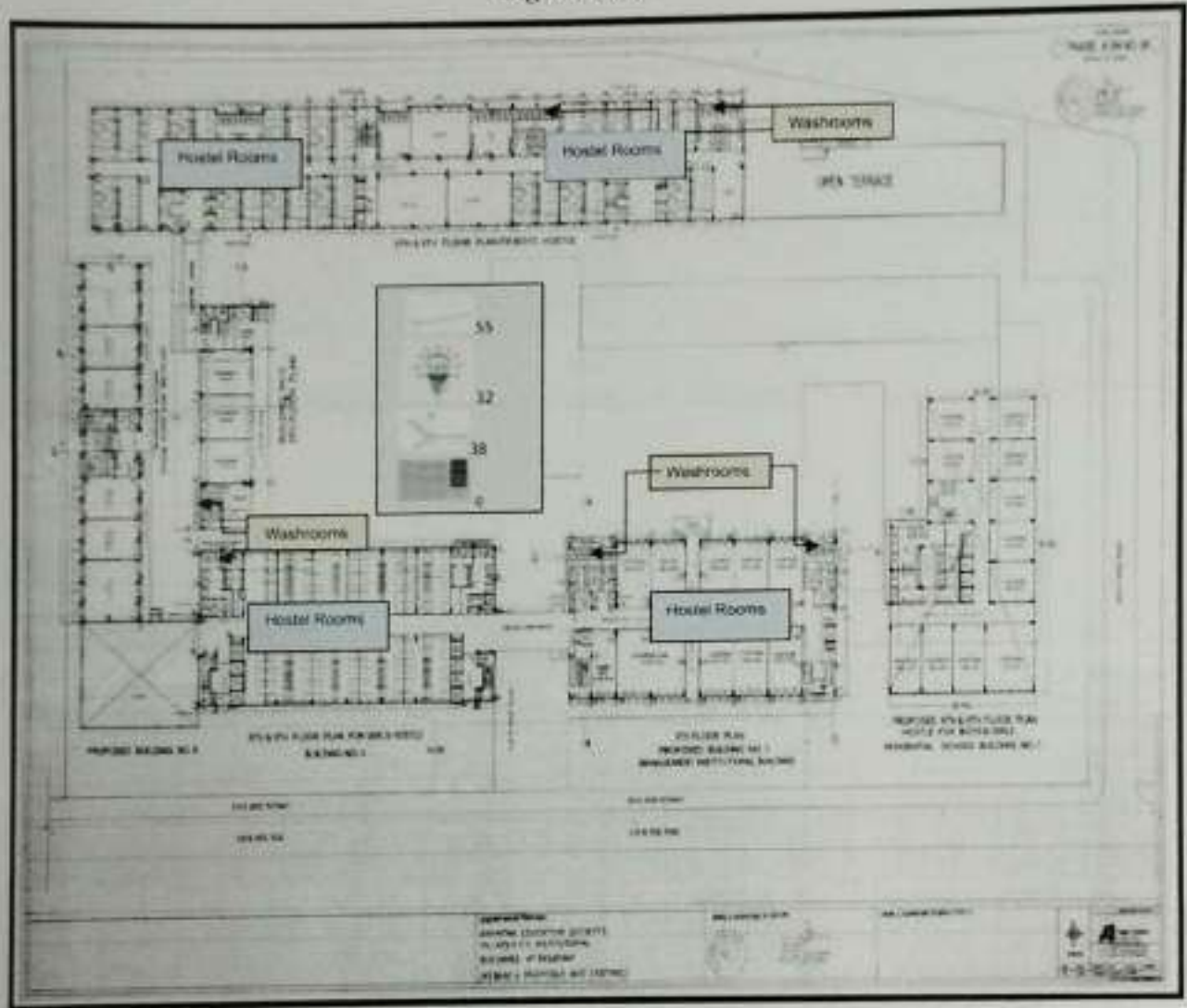


Seventh Floor



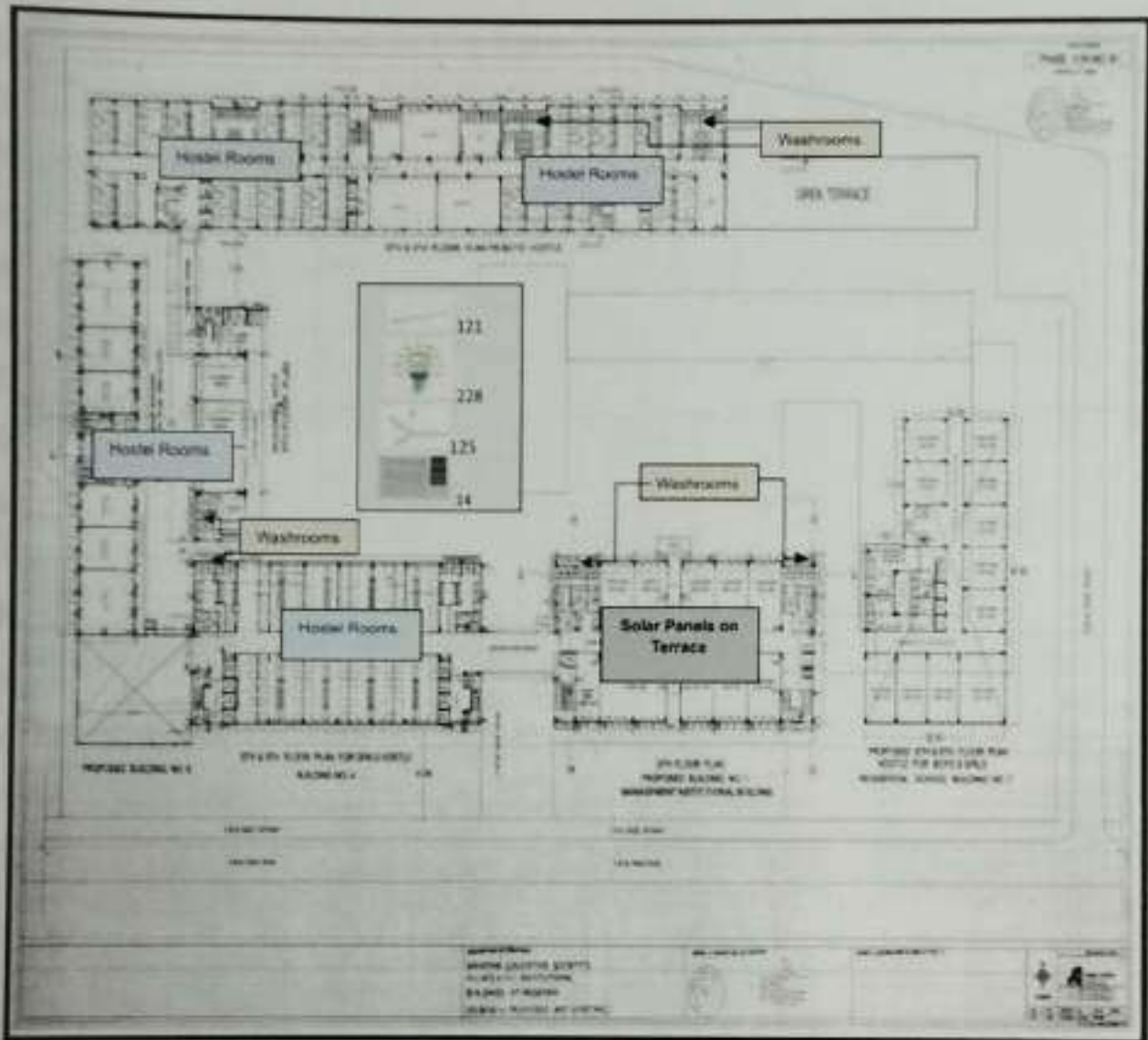


Eighth Floor



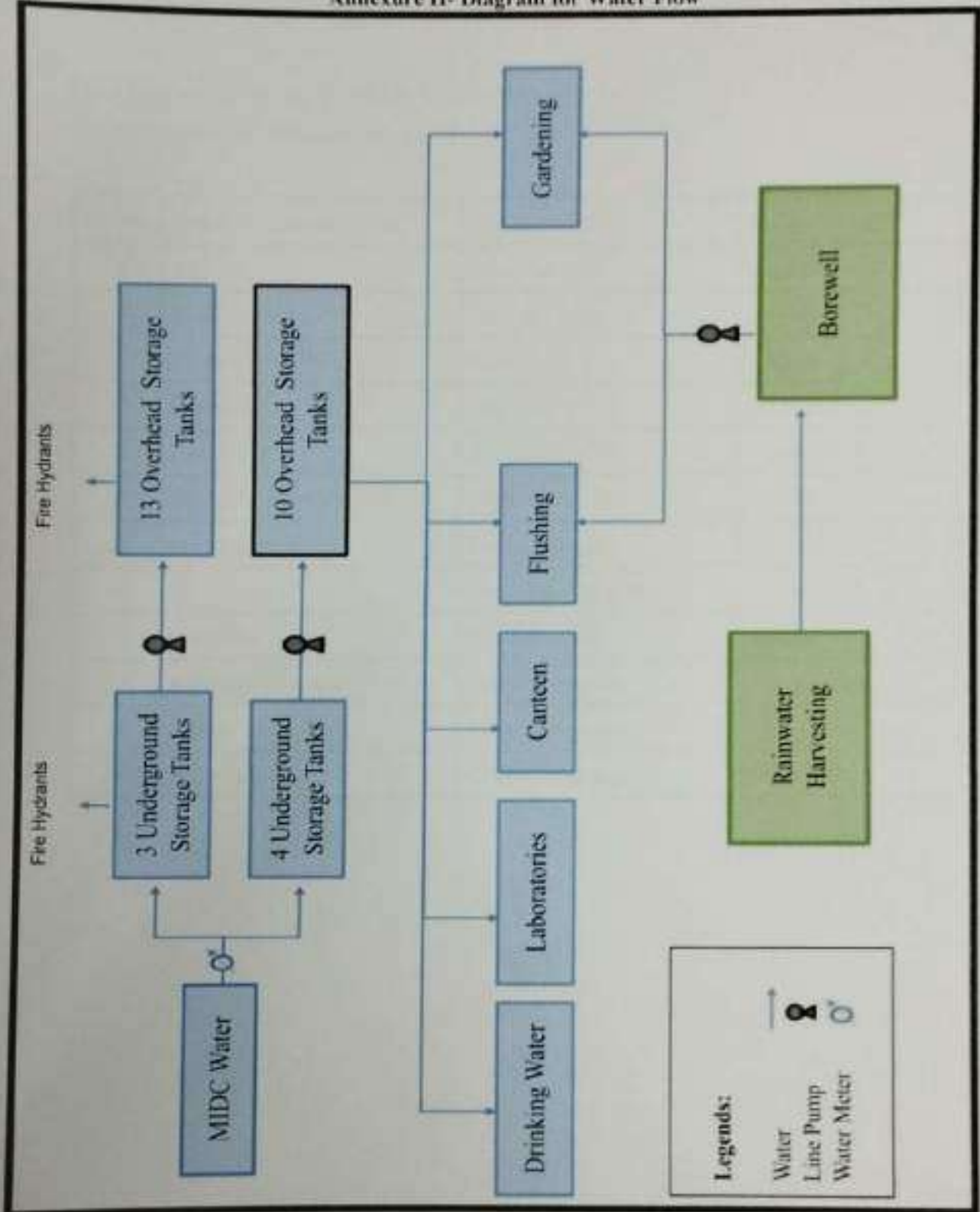


Ninth Floor





Annexure II- Diagram for Water Flow





Annexure III-Details of Indoor Gardening

The indoor plants are very beneficial. It purifies the air pollution.

Few plant species identified in the campus-

| Sl. No. | Species/Scientific name | Common Name | Family |
|---------|-----------------------------|-------------------------|---------------|
| 1 | Aloe | Aloe Vera | Asphodelaceae |
| 2 | Bamboo plant | Bambusa vulgaris | Poaceae |
| 3 | Chinese Evergreen | Aglaonema | Araceae |
| 4 | English Ivy | Hedera helix | Araliaceae |
| 5 | Janet Craig | Dracaena fragrans | Asparagaceae |
| 6 | Golden Pothos or Devils Ivy | Epipremnum aureum | Araceae |
| 7 | Mass Cane | Dracaena fragrans | Asparagaceae |
| 8 | Snake plant | Sansevieria trifasciata | Asparagaceae |
| 9 | Peace Lily | Spathiphyllum | Araceae |
| 10 | Red-edged Dracaena | Dracena marginata | Asparagaceae |
| 11 | Spider Plant | Chlorophytum comosum | Asparagaceae |
| 12 | Parlor Palm | Chamaedorea elegans | Arecaceae |



ANNEXURE IV- List of Electrical Instruments in Energy intensive areas

| Sr. No. | Facility | Details of Provisions |
|---------|--|---|
| 1 | Accounts Department | Computers, Scanners, Projector, CCTV, Cash machines |
| 2 | Administration office | Computers, Cash machine, Printers |
| 3 | Administration offices - 6 | Computers, Printers, Scanners, Air-Conditioners |
| 4 | Classrooms - 165 | Projectors, Speakers |
| 5 | Computer Laboratories | Computers, Air conditioners, Printers, Scanners |
| 6 | Director's room and Principal's room - 6 | Computers, Air conditioners, Printers, Scanners |
| 7 | Electronics and Telecommunication lab | Computers, Printers, Machinery |
| 8 | Library - 4 | Computers, CCTV, Printers-5, Scanners |
| 9 | Lobbies -15 | CCTV |
| 10 | Mechanical Laboratories | 3-Phase machines 54, 1-phase machines-21 |
| 11 | Server Room | Computers, Printers, Air conditioners |
| 12 | Sports room, NSS office, Psychology Laboratory, Counseling room, Audition room | CCTV, Projector |
| 13 | Staff Rooms and Faculty Rooms - 21 | Computers, Printers, Scanners |
| 14 | Workshops - 4 | Machinery |



ANNEXURE-V Distribution of Computers and Printers

| Sr. No. | Facility | Number of facility | Computer | Printer |
|---------|---|--------------------|----------|---------|
| 1 | AICTE Office | 1 | 5 | 2 |
| 2 | PHCET | 1 | 13 | 5 |
| 3 | PHCET Principal | 1 | 1 | 1 |
| 4 | Accounts/ Central Office | 2 | 10 | 3 |
| 5 | Placement | 1 | 4 | 1 |
| 6 | Computer Lab | 12 | 850 | 20 |
| 7 | PHCET Library | 1 | 6 | 2 |
| 8 | AV Room | 25 | 45 | 0 |
| 9 | Physics Department | 1 | 2 | 1 |
| 10 | Chemistry Department | 1 | 1 | 0 |
| 11 | Mechanical | 1 | 1 | 0 |
| 12 | Classroom | 8 | 50 | 4 |
| 13 | Digital Computer Lab | 3 | 30 | 3 |
| 14 | Language Lab | 1 | 20 | 2 |
| 16 | Staff Room | 8 | 15 | 5 |
| 16 | PHCACS Office, IQAC Room and Staff room | 9 | 24 | 9 |
| 17 | PHCACS Exam Cell and CAP Cell | 2 | 15 | 3 |
| 18 | PHCACS - Labs and Library | 7 | 237 | 3 |
| 19 | Admission Cell | 1 | 3 | 1 |
| 20 | PHCET Staff | 1 | 1 | 1 |
| 21 | PHIMSR LIB | 1 | 13 | 1 |
| 22 | PHP LIB | 1 | 7 | 2 |
| 23 | PHP LAB | 1 | 60 | 2 |
| 24 | PHIMSR LAB | 1 | 60 | 2 |
| 25 | PHIMSR Office | 1 | 4 | 2 |
| 26 | PHIMSR Principal | 1 | 1 | 1 |
| 27 | AV Room | 1 | 3 | 0 |
| 29 | PHIMSR Exam cell | 1 | 3 | 1 |
| 30 | PHIMSR AV Room | 1 | 8 | 0 |
| 31 | PHIMSR Staff Room | 1 | 4 | 1 |
| 32 | In Stock | 1 | 30 | 5 |
| TOTAL | | | 1259 | 73 |



ANNEXURE-VI-Checklist of Green Audit

1. Checklist for DayLight

| Sr. No. | Feature | Availability |
|---------|--|--------------|
| 1 | Curtains for window covering | ✓ |
| 2 | Glazing on windows | x |
| 3 | Height windows | ✓ |
| 4 | Openings to East or South to maximize air and sunlight entry | ✓ |
| 5 | Overall structure of building such that sunlight reaches all areas | ✓ |
| 6 | Sufficient illumination | ✓ |
| 7 | Use of glass as facilitator of natural light | ✓ |
| 8 | Use of Sunshade | x |
| 9 | Wider doors | x |
| 10 | Windows Operation | ✓ |
| 11 | Windows with UV filtering | x |



2. Checklist for Ventilation and Air Quality

| Sr. No. | Feature | Availability |
|---------|--------------------------------|--------------|
| 1 | Air Roof Ventilators | x |
| 2 | Cooling System | x |
| 3 | Exhaust fans | ✓ |
| 4 | Height of the Ceiling | ✓ |
| 5 | Spacious Corridors | ✓ |
| 6 | Windows Operating in Condition | ✓ |



3. Checklist for Water Management

| Sr. No. | Measures | Availability |
|---------|--|--------------|
| 1 | Drip Irrigation | ✓ |
| 2 | Dual flush toilet with cistern | x |
| 3 | Flow control water equipments | x |
| 4 | Flow Regulators to water taps | x |
| 5 | Maintenance through efficient Plumbing System | ✓ |
| 6 | Rainwater harvesting | ✓ |
| 7 | Regular maintenance for leakage free plumbing system | ✓ |
| 8 | Toilet Stopcock | x |
| 9 | Water free urinals System to save water | x |



4. Checklist for Energy Use and Conservation

| Sr. No. | Measures | Availability |
|---------|--|--------------|
| 1 | Automatic electrical system monitoring | x |
| 2 | Automatic light control | x |
| 3 | Controlled Lighting | x |
| 4 | Energy efficient equipment | x |
| 5 | Energy saving design | ✓ |
| 6 | Natural light Usage | ✓ |
| 7 | On-site energy generation | ✓ |
| 8 | Regular maintenance of electrical system | ✓ |
| 9 | Solar panel installed | ✓ |
| 10 | Use of CFL and LEDs | ✓ |
| 11 | First Aid Box | ✓ |
| 12 | Fire Extinguisher | ✓ |
| 13 | Fire Alarm | ✓ |
| 14 | Earthing test reports found clear | ✓ |
| 15 | Signage near Power House | ✓ |



GREEN AUDIT 2022-23



5. Waste Management

| Sr. No. | Feature | Availability |
|---------|--|--------------|
| 1 | Bins at ideal location to collect garbage | ✓ |
| 2 | Coloured bins with signage to collect garbage | ✓ |
| 3 | Compost management | ✓ |
| 4 | Donation of computers to NGOs and needy people | ✓ |
| 5 | Efficient Disposal | ✓ |
| 6 | Efficient E- waste management by collecting it in specific place | ✓ |
| 7 | Outsourcing of garbage to agency for recycling | x |
| 8 | Printing on both sides of paper | ✓ |
| 9 | Purchase of electronic products from company's with buyback policy | ✓ |
| 10 | Rainwater harvesting | ✓ |
| 11 | Recycling project or program | x |
| 12 | Reuse of printed paper/ envelopes | ✓ |
| 13 | Reusing | x |
| 14 | Sale of books to its user for minimal charges | ✓ |
| 15 | Segregation of dry and wet waste | ✓ |



6. Building Maintenance

| Sr. No. | Feature | Availability |
|---------|--|--------------|
| 1 | Audio guidance for specially abled | x |
| 2 | Availability of wheelchair | ✓ |
| 3 | Braille assistance for specially abled | x |
| 4 | Easy access to the main entrance of the building | ✓ |
| 5 | Elevator | ✓ |
| 6 | Follow standard procedures for commissioning of electrical/plumbing system | x |
| 7 | Personalized services by staff for differently abled | x |
| 8 | Preferred car park spaces for specially abled | ✓ |
| 9 | Purchase of standardized and quality material for repair | ✓ |
| 10 | Ramp/ stairs with handrails on at least one side | ✓ |
| 11 | Regular maintenance of building | ✓ |
| 12 | Signage in common and exterior areas | ✓ |
| 13 | Toilets in common areas | ✓ |
| 14 | Uniformity in floor level | ✓ |
| 15 | Use of chemical free products for cleaning | x |
| 16 | User awareness program to minimize damage of property | ✓ |



GREEN AUDIT 2022-23



7. Checklist for Green Management

| Sr. No. | Green program | Availability |
|---------|--|--------------|
| 1 | Availability of e-books/ magazines and online resource | ✓ |
| 2 | Buying recycled material | x |
| 3 | Campus conduct environmental aware program | ✓ |
| 4 | Contribute library information on sustainability resources to Campus publication, blog or website | ✓ |
| 5 | Creation of "Green Team" in the institution/library | x |
| 6 | Outreach relationships with local groups interested in environmental concern and satisfy their information needs | ✓ |
| 7 | Recycling of Papers, aluminum, plastic, e-waste | ✓ |
| 8 | Reduce, Reuse and recycle of the products (At the time of disposal of library material) | ✓ |



ACKNOWLEDGEMENT

RB Energy Consultancy Green Audit Team acknowledges with thanks the cooperation and support extended to the team members during the Green Audit at MAHATMA EDUCATION SOCIETY'S Pillai HOCL Campus, Rasayani.

We deeply appreciate the interest, enthusiasm and commitment of MAHATMA EDUCATION SOCIETY, Rasayani Campus team towards the Green Audit activity. We would also like to place on record our sincere thanks and appreciation to all other members who helped in the Audit.

We appreciate your business and take it seriously when you place your trust in us. We use calibrated instruments and also have our own Thermography camera. Since the condition of buildings and equipment changes over time, we can only report the conditions that existed at the time of our inspection.

We recommend that you have mission critical equipment re-inspected on an annual basis and that you keep previous inspection reports to help with establishing baseline conditions for any items in question. The conditions and recommended actions reported herein are merely the opinion of the Audit Team and any item with an action level should be investigated and repaired by a qualified and licensed person.

This report does not claim to set forth all existing hazards or to indicate that other hazards do not exist. The inspection and report are performed and prepared for the use of the client. RB Energy Consultancy Services accepts no responsibility for use or misinterpretation by third parties. Our inspection of the property and the accompanying report are in no way intended to be a guarantee or warranty of any kind.

RB Energy Consultancy Services and its employees assume no liability whatsoever for any damage or loss arising from or connected with this inspection and report, including discovering, or failing to inspect or discover any condition.

We reserve the right to refuse to open or access any equipment in cases where there is insufficient PPE (personal protective equipment) available or an insufficient protective boundary for nearby personnel.



ELECTRICAL ENERGY AUDIT 2022-23



**Electrical Energy Audit Report
For
MAHATMA EDUCATION SOCIETY
RASAYANY - HOC**



Presented By
NEW RB ENERGY CONSULTANCY



Conducted on – 28 APRIL -2023



ACKNOWLEDGEMENT

RB Energy Consultancy Electrical Safety Audit Team acknowledges with thanks the co-operation and support extended to the team members during the Electrical Safety Audit at MAHATMA EDUCATION SOCIETY (RASAYANY).

We deeply appreciate the interest, enthusiasm and commitment of MAHATMA EDUCATION SOCIETY (RASAYANY) team towards the Electrical Safety Audit activity. We would also like to place on record our sincere thanks and appreciation to all other members who helped in the Electrical Safety Audit.

We appreciate your business and take it seriously when you place your trust in us. We use calibrated instruments and also have our own Thermography camera. Since the condition of buildings and equipment changes over time, we can only report the conditions that existed at the time of our inspection.

We recommend that you have mission critical equipment re-inspected on an annual basis and that you keep previous inspection reports to help with establishing baseline conditions for any items in question. The conditions and recommended actions reported herein are merely the opinion of the Electrical Safety Audit Team and any item with an action level should be investigated and repaired by a qualified and licensed electrician.

This report does not claim to set forth all existing hazards or to indicate that other hazards do not exist. The inspection and report are performed and prepared for the use of the client. RB Energy Consultancy Services accepts no responsibility for use or misinterpretation by third parties. Our inspection of the property and the accompanying report are in no way intended to be a guarantee or warranty of any kind.

RB Energy Consultancy Services and its employees assume no liability whatsoever for any damage or loss arising from or connected with this inspection and report, including discovering, or failing to inspect or discover any condition.

We reserve the right to refuse to open or access any equipment in cases where there is insufficient PPE (personnel protective equipment) available or an insufficient protective boundary for nearby personnel.



ELECTRICAL ENERGY AUDIT 2022-23

TABLE OF CONTENTS

| Sr. No. | INDEX | Page No. |
|---------|--|----------|
| 1 | Inspection and Identification | 4 |
| 2 | Specifications of Instruments used | 4 |
| 3 | Introduction | 5 |
| 4 | Recommendations | 6 |
| 5 | Report Summary | 7 |
| 6 | Main Power Panels | 8 |
| 7 | General Observations & Recommendations | 15 |
| 8 | General Suggestions | 19 |
| 9 | Conclusion | 21 |



ELECTRICAL ENERGY AUDIT 2022-23

1. INSPECTION IDENTIFICATION

| | |
|----------------------|--------------------------------------|
| Client Name | MAHATMA EDUCATION SOCIETY |
| Site Location | MAHATMA EDUCATION SOCIETY (RASAYANY) |
| Performed By | NEW RB ENERGY CONSULTANCY |
| Scope of Work | ELECTRICAL ENERGY AUDIT |

2. SPECIFICATIONS OF INSTRUMENTS USED

The following equipment's were used to perform this study

| Sr. No | Instrument | Make | Range of Instruments |
|--------|---------------------|---------------------------------|--|
| 1 | Thermal Imager | Testo | Temperature range - 40°C to 500°C |
| 2 | Load Manager | Trinity Energy System- (Oracle) | RMS AC Voltage -230 /415 V RMS AC Current Up to 1000A |
| 3 | Digital Clamp meter | Meco | 400A AC / DC, |



ELECTRICAL ENERGY AUDIT 2022-23

3. INTRODUCTION

This report details the Electrical Safety Audit activity conducted for HOC MAHATMA EDUCATION SOCIETY (RASAYANY). The audit was carried out with the assistance of a member of staff whose role was to identify and locate equipment to be inspected together with opening Electrical Panel doors.

The aim of this report is to highlight the areas that do not comply with the statutory electrical safety rules. Recommendations are provided for the issues observed as per the priority of High, Medium and Low basis which will help the client to take appropriate action on the same.

Locations on the panels and other areas in the common areas of the building were visited and observations were made and images were clicked as a matter of proof. This report includes suggestions to improve upon the faulty areas and a guide to improve the systems further.



4. RECOMMENDATIONS

The recommendations given in this report are intended as a guide only and should be used in conjunction with advice from the maintenance services provider. The priorities are not intended to be prescriptive; recommendations will depend on individual equipment's.

The recommendation priority will very much depend on the type of components being inspected and their environment. As an example, the following priority classification that will be applied for taking action on the respective areas

| Priority | Recommendations |
|-----------------|--|
| 1 | Immediate action should be taken |
| 2 | Remedial action should be undertaken at the earliest opportunity |
| 3 | Remedial action should be taken at the next planned maintenance activity |

The actions to be taken are completely on the client and the audit company shall not be responsible for it.

Note: Please note that the below mentioned pending/snags are recorded during our visit at sites. There can be cases where these pending snags were addressed by client in due course of time.



ELECTRICAL ENERGY AUDIT 2022-23

5. REPORT SUMMARY

| Panel Name | Equipment / Item | Observation | Recommended Action | Priority |
|---------------------|------------------------------------|--|--|----------|
| COMMON OBSERVATIONS | First Aid / Shock Treatment Charts | Shock treatment charts not displayed in panel room | individual panel rooms to have a pictorial and explanatory shock treatment chart | 1 |
| | Fire Schematic | Fire schematic not mentioned at the entry of panel rooms | Fire schematic needs to be provided at every panel room | 1 |

Note: - Following are a list of common observations made. These are very HIGH priority observations and are needed to be complied with as soon as possible.





ELECTRICAL ENERGY AUDIT 2022-23

The following is a list of detailed observations found during the Electrical Safety and Energy Audit activity. The recommendations for the observed issues are also mentioned in the report below.

5.1 MAIN POWER PANELS

| Panel Name | Equipment / Item | Observation | Recommended Action | Priority |
|------------|--------------------------------|--|--|----------|
| A & B | Electrical Single line diagram | Electrical single diagram is not found in electrical room | In case of emergency Electrical single diagram will be useful to understand existing connection. | 2 |
| | Fire Extinguishers | Fire extinguisher are provided but not 5ft on wall mounted | They should be wall mounted for ease in operation during fire hazards | 2 |



ELECTRICAL ENERGY AUDIT 2022-23



| Panel Name | Image No. | Observation | Recommended Action | Priority |
|---|------------------------------------|--|--|----------|
| Distribution board & Sub Distribution board | A, B,C,D, E,F,G,H I,J,K,L | O/G cable tagging is required & cable entry need to be closed. so that lizard will not enter into panel. | Kindly get the tag installed for proper identification of cables. Cable openings need to be closed. Panel cleaning is required by blower. Proper straight pin lug is required. | 2 |
| | | Without lug wire conductor is connected to MCB. | | |
| | | Glanding is not done to cable. Incoming wire openings need to be closed. So that lizard will not enter into panel. | Kindly get proper glanding done. | 2 |
| | | Enclosure not provided on sub distribution panel. | Kindly provide enclosure. | 2 |
| | | Electrical Insulating mat is not founding on flooring | Electrical Insulating mat is provided on flooring | |



ELECTRICAL ENERGY AUDIT 2022-23

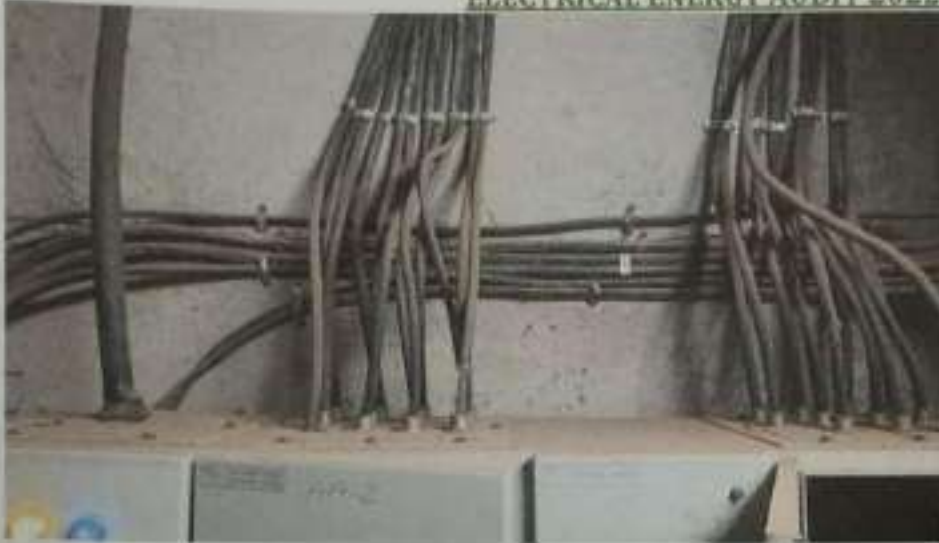


Main Electric panel

1. Electrical single diagram is not found,
2. Emergency Contact Details,
3. Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry".
4. 5Kgs, CO2 type fire extinguisher is providing.



ELECTRICAL ENERGY AUDIT 2022-23



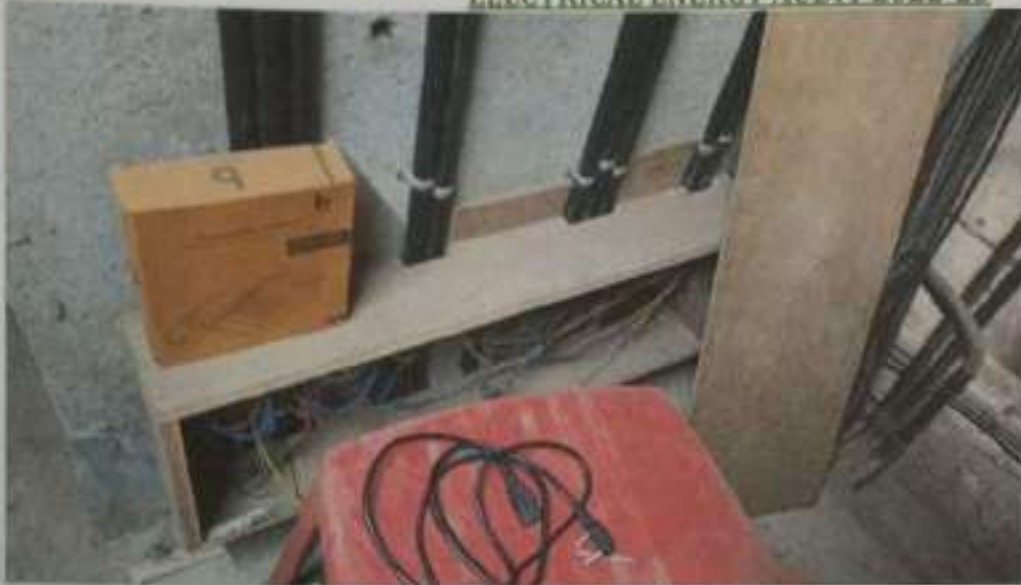
Kindly get the tag installed for proper identification of cables.
Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry"
Electrical Insulating mat is provided on flooring.
5Kgs. CO2 type fire extinguisher is providing.



Kindly get the tag installed for proper identification of cables.



ELECTRICAL ENERGY AUDIT 2022-23



Kindly get the tag installed for proper identification of cables.
Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry" "Electrical Insulating mat is provided on flooring.

Need to covered properly.
Unwanted material found in panel.



ELECTRICAL ENERGY AUDIT 2022-23



Kindly get the tag installed for proper identification of cables.
Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry"



ELECTRICAL ENERGY AUDIT 2022-23



Kindly get the tag installed for proper identification of cables.
Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry"



ELECTRICAL ENERGY AUDIT 2022-23



Electrical Insulating mat is provided on flooring.



ELECTRICAL ENERGY AUDIT 2022-23



Unwanted material found in panel room.
Earthing bolts was Rusted.



ELECTRICAL ENERGY AUDIT 2022-23



| Location : Office are | | |
|--|--------------|----------------------------------|
| Parameters | Observations | Remarks |
| Fire Extinguisher | | - Need to hang on wall at 5 feet |
| MCP/BGU | √ | Found ok |
| Observation on Fire Extinguisher | √ | Not renewed |
| Signage's | √ | Found okay |
| Emergency Contact Details | x | Must be required |
| Fire related Training | √ | Found ok |
| Responsibility Matrix availability | X | Must Required |
| Escape routes (hurdles in path, signage's, illumination) | X | Must Required |
| Sprinkler system catering all areas | √ | ---- |
| Smoke/Heat detector active / inactive catering all areas | √ | ---- |
| PA system working | X | Found okay |
| Healthiness of System | √ | Found ok |
| Emergency Lighting | X | Must Required |
| First Aid Kit | √ | Found ok |
| Electric Shock Treatment Chart | x | Found okay |



ELECTRICAL ENERGY AUDIT 2022-23

7. General Observations & Recommendations

| No's | Particulars | Comment |
|------|---|---|
| 1 | Proper entry/access is provided for electrical room | Yes |
| 2 | Proper door (lock arrangement) is provided | Yes |
| 3 | Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry" | No |
| 4 | Electrical Insulating mat is provided on flooring | Yes |
| 5 | Proper illumination is provided near distribution boards and main isolation switches | Yes |
| 6 | Proper ventilation is provided for electrical panels and switchgears | Yes |
| 7 | Space is sufficient to provide proper access to the switchgear for maintenance work | Yes |
| 8 | 5Kgs, CO2 type fire extinguisher (1 no.) is provided and is within the periodic test life | No |
| 9 | Any abnormal overheating of cable, terminations and switchgear | No |
| 10 | Switchgears are enclosed from | No |
| A | Front | Found ok |
| B | Top cable entry | Gland & cable sport required try required |
| c | Bottom cable entry | Ok |
| 11 | Electrical panels, switchgears and distribution boards are clean and free from dust and moisture. | Yes (Unwanted material) |
| 12 | Cables are glanded properly at terminations. | No |
| 13 | Cables are laid/ routed in safe manner | Yes |
| 14 | Handles are provided to the switchgears and are in good working condition | Yes |
| 15 | Proper earthing is provided to electrical installations (panels/switchgears/DBs etc.) | Yes |
| 16 | There are no live conductors/ busbars in open condition | No |
| 17 | Up to date Single Line Diagram (as laid) is displayed inside the electric room | No |



ELECTRICAL ENERGY AUDIT 2022-23

| | | |
|----|--|----------|
| 18 | Electric supply board cutouts (Fuse Holder of ESCO) are properly enclosed | Yes |
| 19 | Electrical feeders are identified with the load they will be operating and marked accordingly. | No |
| 20 | Electrical room is maintained clean and no unwanted material is stored in electrical room | No |
| 21 | The room has proper roof and there is no possibility for water leakage/seepage. | Found Ok |
| 22 | Test reports of electrical installations like earthing test reports are valid and dated. | Yes |

| Parameter | Observation | Recommendations | Priority |
|---|---|---|----------|
| Personal Protective Equipment's used by Technicians | It is observed that the technicians operated sans Hand Gloves while working on electrical installations | Strongly recommended to provide the technicians with safety gloves even for LT side | 1 |
| Tools used by Technicians | Tools and Equipment's are not found | Kindly get the measuring instruments calibrated on a quarterly basis to maintain its accuracy | 3 |



8. GENERAL SUGGESTIONS

Following are the best practices that shall be implemented to achieve better safety standards and enhance quality of work:

1) Handover format and follow-up: (refer below Table-1)

- Kindly maintain the following format for the Handover format which is a standardized format.
- This will help in better handover to the next shift personnel and also maintain a proper record of the issues addressed and actions taken against the same.

2) Tools storage room: (refer below Figure-1)

- Tools used by the Facility team i.e. by technicians / supervisors are to be stored in the manner depicted in Figure-1 below.
- Tools need to be protected from damage either physical or atmospheric conditions and hence need to be stored carefully.

3) Yearly calibration:

- Calibration of the Energy meters on the main power panels is of utmost importance to ensure that the readings that are being taken are appropriate and accurate.



ELECTRICAL ENERGY AUDIT 2022-23

3.4 GENERAL OBSERVATIONS

| Sr. No | Equipment / Item | Observation | Recommended Action | Priority |
|--------|--------------------------|---|--|----------|
| 1 | Manual Call Points (MCP) | MCPs are not covered | MCPs needed to be covered by a normal cover to avoid needless tripping leading to havoc conditions. | 1 |
| 2 | PA System | PA system is installed in office area. | Not Found | 1 |
| 3 | Entrance door | Door is unable to open automatic freely when fire alarm device activated during emergency | Kindly ensure the opening of the door in case of fire emergency | 1 |
| 4 | Exit Route Signage | Exit route signage were not installed | Kindly ensure 24x7 illumination of exit route signage to facilitate easy escape in case of emergency | 1 |





ELECTRICAL ENERGY AUDIT 2022-23

| Year | Month | Day | 2 nd shift Engineer | 2 nd shift Technicians | Sr. no. | Time | Location | Details of complainant | | Details of complaint | Action taken / Details of Regular activities | Status (job done/pending) | Attended by |
|------|-------|-----|--------------------------------|-----------------------------------|---------|------|----------|------------------------|-----------------|----------------------|--|---------------------------|-------------|
| | | | | | | | | Name | Contact Details | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Table-1: Standardized Handover format



Figure-1



Figure-2

4) Work Permit Format:

- Kindly follow the following format that indicates a standardized Work Permit Format.

Electrical Work Permit

Date:

WP NO:

Block Ref :
Area :
Details of work :
Work suggested by :
(Company Name)

| PRECAUTION OR SPECIFIC REQUIREMENTS | | | | | |
|-------------------------------------|---|---|---|---|---|
| | Y | N | | Y | N |
| Availability of LOTO procedure | | | Usage of 3 pin sockets in all Electrical appliances | | |
| Qualified Electricians | | | Availability of Electrical safety gloves | | |
| No physical damage in wires | | | Electrical insulation mats in the area of work | | |
| Area of work is free of water | | | Usage of proper PPEs | | |
| Follow up of earthing practices | | | Warning Signage | | |
| Usage of insulated tools | | | | | |

Start Time:

Expected time of completion:

Time of completion:

The safety requirement need to be followed have been explained to me and I understood the safety requirements. We will follow the same while executing the work.

Signature of person requesting permit

Name:

Date:

The safety requirement should be followed without deviation till completion of the scheduled activity. Any deviation will lead to cancellation of this Permit. This permit is valid for the stipulated period only. Same should be renewed after the stipulated period.

Project: MAHATMA EDUCATION SOCIETY (RASAYANY)

Signature of (respective agency)

Signature of person authorizing the Permit

Name:

Date:

Designation:

9. CONCLUSION

The Electrical Safety Audit carried out, has brought to light a few critical areas that need to be rectified or replaced in order for a safer future.

The observations and recommendations are suggested in a HIGH, MEDIUM and LOW priority of compliance time required.

It is up to the client to implement the recommendations suggested by New RB Energy Consultancy

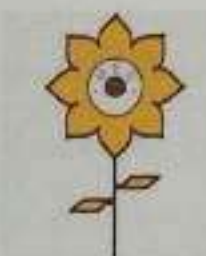


ELECTRICAL SAFETY AUDIT 2022-23



Electrical safety Audit Report

For
**MAHATMA EDUCATION SOCIETY
RASAYANY - HOC**



Presented By
NEW RB ENERGY CONSULTANCY



Conducted on – 28 APRIL-2023



ELECTRICAL SAFETY AUDIT 2022-23

ACKNOWLEDGEMENT

RB Energy Consultancy Electrical Safety Audit Team acknowledges with thanks the co-operation and support extended to the team members during the Electrical Safety Audit at MAHATMA EDUCATION SOCIETY – RASANANY HOC. We deeply appreciate the interest, enthusiasm and commitment of MAHATMA EDUCATION SOCIETY – RASANANY HOC team towards the Electrical Safety Audit activity. We would also like to place on record our sincere thanks and appreciation to all other members who helped in the Electrical Safety Audit.

We appreciate your business and take it seriously when you place your trust in us. We use calibrated instruments and also have our own Thermography camera. Since the condition of buildings and equipment changes over time, we can only report the conditions that existed at the time of our inspection.

We recommend that you have mission critical equipment re-inspected on an annual basis and that you keep previous inspection reports to help with establishing baseline conditions for any items in question. The conditions and recommended actions reported herein are merely the opinion of the Electrical Safety Audit Team and any item with an action level should be investigated and repaired by a qualified and licensed electrician.

This report does not claim to set forth all existing hazards or to indicate that other hazards do not exist. The inspection and report are performed and prepared for the use of the client. RB Energy Consultancy Services accepts no responsibility for use or misinterpretation by third parties. Our inspection of the property and the accompanying report are in no way intended to be a guarantee or warranty of any kind.

RB Energy Consultancy Services and its employees assume no liability whatsoever for any damage or loss arising from or connected with this inspection and report, including discovering, or failing to inspect or discover any condition.

We reserve the right to refuse to open or access any equipment in cases where there is insufficient PPE (personnel protective equipment) available or an insufficient protective boundary for nearby personnel.



ELECTRICAL SAFETY AUDIT 2022-23

TABLE OF CONTENTS

| Sr. No. | INDEX | Page No. |
|---------|--|----------|
| 1 | Inspection and Identification | 4 |
| 2 | Specifications of Instruments used | 4 |
| 3 | Introduction | 5 |
| 4 | Thermography | 8 |
| 5 | General Observations & Recommendations | 18 |



ELECTRICAL SAFETY AUDIT 2022-23

INSPECTION IDENTIFICATION

| | |
|---------------|--------------------------------------|
| Client Name | MAHATMA EDUCATION SOCIETY - HOC |
| Site Location | MAHATMA EDUCATION SOCIETY - RASANANY |
| Performed By | New RB Energy Consultancy |
| Scope of Work | Electrical Safety Audit |

2. SPECIFICATIONS OF INSTRUMENTS USED

The following equipment's were used to perform this study

| Sr. No | Instrument | Make | Range of Instruments |
|--------|---------------------|---------------------------------|--|
| 1 | Thermal Imager | Testo | Temperature range -40°C to 500°C |
| 2 | Load Manager | Trinity Energy System- (Oracle) | RMS AC Voltage -230 /415 V RMS AC Current Up to 1000A |
| 3 | Digital Clamp meter | Meco | 400A AC / DC, |



ELECTRICAL SAFETY AUDIT 2022-23

INTRODUCTION

This report details the Electrical Safety Audit activity conducted for MAHATMA EDUCATION SOCIETY – RASANANY HOC. The audit was carried out with the assistance of a member of staff whose role was to identify and locate equipment to be inspected together with opening Electrical Panel doors.

The aim of this report is to highlight the areas that do not comply with the statutory electrical safety rules. Recommendations are provided for the issues observed as per the priority of High, Medium and Low basis which will help the client to take appropriate action on the same.

Locations on the panels and other areas in the common areas of the building were visited and observations were made and images were clicked as a matter of proof. This report includes suggestions to improve upon the faulty areas and a guide to improve the systems further.



ELECTRICAL SAFETY AUDIT 2022-23

4.

RECOMMENDATIONS

The recommendations given in this report are intended as a guide only and should be used in conjunction with advice from the maintenance services provider. The priorities are not intended to be prescriptive; recommendations will depend on individual equipment's.

The recommendation priority will very much depend on the type of components being inspected and their environment. As an example, the following priority classification that will be applied for taking action on the respective areas

| Priority | Recommendations |
|----------|--|
| 1 | Immediate action should be taken |
| 2 | Remedial action should be undertaken at the earliest opportunity |
| 3 | Remedial action should be taken at the next planned maintenance activity |

The actions to be taken are completely on the client and the audit company shall not be responsible for it.

Note: Please note that the below mentioned pending/snags are recorded during our visit at sites. There can be cases where these pending snags were addressed by client in due course of time.



ELECTRICAL SAFETY AUDIT 2022-23

6. Thermography study

| Temperatures | Recommendations |
|-----------------------|--|
| Above 70°C | Urgent action should be taken |
| Between 55°C and 70°C | Corrective action should be undertaken at the earliest occasion |
| Between 40°C and 55°C | Corrective action should be taken at the next planned maintenance activity |
| 20°C to 40°C | Found okay |



ELECTRICAL SAFETY AUDIT 2022-23

Image No: - 01

Visual Image



Thermal Image



| | |
|------------------|------------|
| Location | MMS B-Wing |
| Equipment | Changeover |
| Fault Location | N - Phase |
| Area Temperature | 26.4 |

| Object Parameters | Value |
|--------------------------|------------|
| Image File Name | 00198 |
| Emissivity | 1 |
| Max Hot Spot Temperature | 68.4 |
| Fault Rating | Priority 1 |

ANALYSIS & OBSERVATIONS

Found hit on N – Phase

Corrective action should be taken at the next planned maintenance activity



ELECTRICAL SAFETY AUDIT 2022-23

Image No: - 02

Visual Image



Thermal Image



| | |
|------------------|--------------------|
| Location | Main Electric room |
| Equipment | Capacitor |
| Fault Location | Normal |
| Area Temperature | 26.4 |

| Object Parameters | Value |
|--------------------------|------------|
| Image File Name | 00195 |
| Emissivity | 1 |
| Max Hot Spot Temperature | 82.9 |
| Fault Rating | Priority 1 |

ANALYSIS & OBSERVATIONS

Found hot on capacitor terminal due to loose connection.



ELECTRICAL SAFETY AUDIT 2022-23

Image No: - 03

Visual Image



Thermal Image



| | |
|------------------|-----------------|
| Location | Main panel room |
| Equipment | Engg. Main |
| Fault Location | R - Phase |
| Area Temperature | 26.4 |

| Object Parameters | Value |
|--------------------------|--------|
| Image File Name | 00191 |
| Emissivity | 1 |
| Max Hot Spot Temperature | 37.3 |
| Fault Rating | Normal |

ANALYSIS & OBSERVATIONS

Found Normal



ELECTRICAL SAFETY AUDIT 2022-23

Image No: - 04

Visual Image



Thermal Image



| | |
|------------------|--------------------|
| Location | Main Electric room |
| Equipment | Main Switch |
| Fault Location | R- phase |
| Area Temperature | 26.4 |

| Object Parameters | Value |
|--------------------------|------------|
| Image File Name | 00186 |
| Emissivity | 1 |
| Max Hot Spot Temperature | 58.1 |
| Fault Rating | Priority 2 |

ANALYSIS & OBSERVATIONS

Found loose connection on R-phase

Corrective action should be taken at the next planned maintenance activity



ELECTRICAL SAFETY AUDIT 2022-23

Image No: - 05

Visual Image



Thermal Image



| | |
|------------------|----------------------------------|
| Location | Architecture B-wing |
| Equipment | Panel room 5 th floor |
| Fault Location | Normal |
| Area Temperature | 26.4 |

| Object Parameters | Value |
|--------------------------|--------|
| Image File Name | 00196 |
| Emissivity | 1 |
| Max Hot Spot Temperature | 27.2 |
| Fault Rating | Normal |

ANALYSIS & OBSERVATIONS

Found Normal

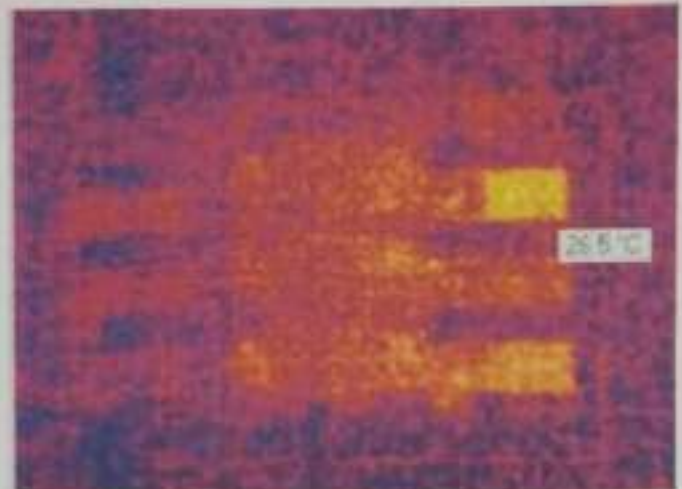
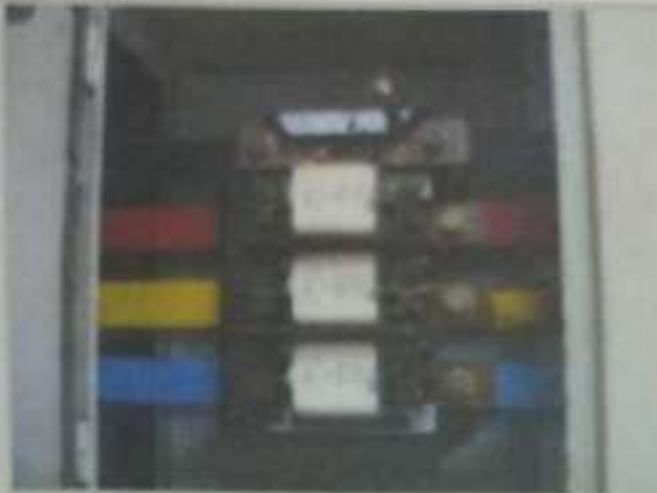


ELECTRICAL SAFETY AUDIT 2022-23

Image No: - 06

Visual Image

Thermal Image



| | |
|------------------|-------------------------|
| Location | Main panel room |
| Equipment | Fuse location Eng. main |
| Fault Location | Normal |
| Area Temperature | 26.4 |

| Object Parameters | Value |
|--------------------------|--------|
| Image File Name | 00197 |
| Emissivity | 1 |
| Max Hot Spot Temperature | 26.5 |
| Fault Rating | Normal |

ANALYSIS & OBSERVATIONS

Found ok
Its Normal