Mahatma Education Society's

Pillai HOC College of Arts, Science and Commerce, Rasayani

(Accredited by NAAC and ISO 9001:2015 Certified)

7.1.3 QnM
Quality Audits on Environment and Energy regularly undertaken by the Institution

(From A.Y. 2017-18 to A.Y. 2021-22)

Pillai's HOC College of Arts, Science and Commerce Rasayani

Principal
Mahatma Education Society's
Pillai's HOC College of Arts
Science and Commerce
HOC Educational Campus,
Rasayani, Tal. Khalapur,
Dist. Raigad. PIN - 410 207

7.1.6

महाराष्ट्र वन विभाग
वृक्षवल्ली आम्हा सोयरे वनचरे

सत्यमेव जयते
महाराष्ट्र शासन

वनपरिक्षेत्र अधिकारी, खालापूर यांचे कार्यालय
मु.पो.ता.खालापूर, जि. रायगड, ४१०२०२
फोन नं.०२१९२-२७५२७२ ई-मेल :- rfokhalapur@gmail.com

Date:- 29/07/2021

CERTIFICATE OF APPRECIATION

This is awarded to Dr. Lata Menon,Principal of Pillai HOC College of Arts, Science and Commerce, Rasayani to acknowledge the institutions participation and efforts to maintain **Green and Clean Campus** for the Academic Year 2021-22

Range Forest Officer
Khalapur

7.1.6

वृक्षवल्ली आम्हा सोयरे वनचरे

वनपरिक्षेत्र अधिकारी, खालापूर यांचे कार्यालय
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फोन नं.०२१९२-२७१२७२ ई-मेल :- rfokhalapur@gmail.com

Date:- 15/02/2021

CERTIFICATE OF APPRECIATION

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Khalapur

7.1.6

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फोन नं.०२१९२-२७५२७२ ई-मेल :- rfokhalapur@gmail.com

Date:- 26/07/2018

CERTIFICATE OF APPRECIATION

This is awarded to Dr. Lata Menon,Principal of Pillai HOC College of Arts, Science and Commerce, Rasayani to acknowledge the NSS Unit participation and efforts to maintain **Green Environment** for the Academic Year 2018-19

Range Forest Officer
Khalapur

RB ENERGY
CONSULTANCY

Kavi Bhagwan Newas, Samta Nagar, Opp.Foot Over Bridge, Near Rly Station, Paghar (E). 401404. Tal-Dist. Palghar, Maharashtra
E-Mail : info@electricalenergyaudit.com / newrb.energy@gmail.com
Contact : 09370777100 / 08080911944

Date: 09/09/2021

CERTIFICATE

ELECTRICAL SAFETY AUDIT

This is to certify that a detailed **Electrical Safety Audit** for **Mahatma Education Society's Pillai HOC College of Arts, Science & Commerce, Rasayani** has been conducted for the year 2021-22 to assess Emergency control procedures, Grounding & earthing, Diesel generator and its availability, Lightning protection system, Emergency power distribution system.

The activities and measures carried out by the institute have been verified and found to be satisfactory. The efforts taken by the institute, faculty and students are highly commendable.

Mr. Umesh Waghela

RB Energy Consultancy

Certified Energy auditor (BEE), EA-7559 Certificate, 4541

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E-Mail : info@electricalenergyaudit.com / newrb.energy@gmail.com
Contact : 09370777100 / 08080911944

Date: 08/09/2021

CERTIFICATE

GREEN AUDIT

This is to certify that a detailed **Green Audit** for **Mahatma Education Society's Pillai HOC College of Arts, Science & Commerce, Rasayani** has been conducted for the year 2021-22 to assess the green initiative planning, efforts, activities implemented in the campus like Rainwater harvesting, Solar energy Usage, Swach Bharat Abhiyaan, wastewater management, recycle of waste etc.

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Date: 08/09/2021

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Contact : 09370777100 / 08080911944

Date: 6/10/2020

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E-Mail : info@electricalenergyaudit.com / newrb.energy@gmail.com
Contact : 09370777100 / 08080911944

Date: 5/10/2020

CERTIFICATE

GREEN AUDIT

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E-Mail : info@electricalenergyaudit.com / newrb.energy@gmail.com
Contact : 09370777100 / 08080911944

Date: 5/10/2020

CERTIFICATE

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Mr. Umesh Waghela

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E-Mail : info@electricalenergyaudit.com / newrb.energy@gmail.com
Contact : 09370777100 / 08080911944

Date: 13/06/2019

To,
PILLAI HOC COLLEGE OF ARTS, SCIENCE AND COMMERCE,
RASAYANI,
MAHARASHTRA.

Sub: ELECTRICAL SAFETY AUDIT of PILLAI HOC COLLEGE OF ARTS, SCIENCE AND COMMERCE, RASAYANI, MAHARASHTRA.

Dear Sir,

Refer to our Electrical Safety Audit conducted in your College at above mentioned address on 13 Jun 2019.

We certify that you're PILLAI HOC COLLEGE OF ARTS, SCIENCE AND COMMERCE, is Electrical Safety compliance & audit as per Electricity Act & Rules, Certify along with this letter and quarterly maintenance of electrical panel switchgears and Electrical System for conservation.

Thank and Regards,

For RB Energy

(Authorized Signatory)

Mr. Sunil A. Apte. & Mr. Umesh R. Waghela

RB ENERGY CONSULTANCY

Certified Energy Auditor (BEE), EA- 7559 Certificate, 4541

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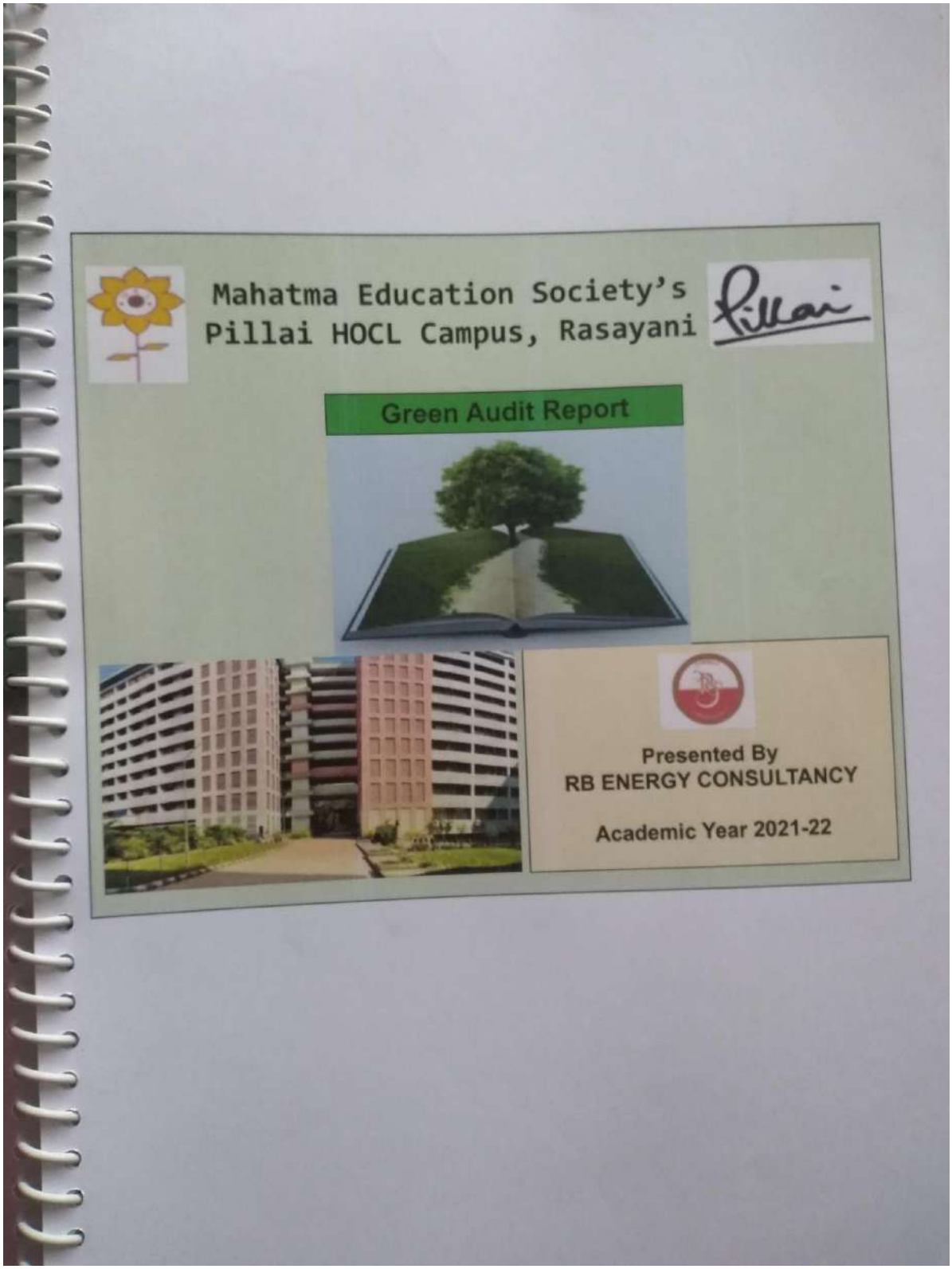
Audit Reports



GREEN AUDIT 2021

Green Audit Report of Mahatma Education Society's HOCL, Rasayani campus is conducted by RB Energy Consultancy Services and its team on **19th and 20th August 2021.**

Green Audit report states the initiatives taken by institute towards environment sustainability

Team RB Energy Consultancy

Green Audit Assessment Team

(Internal)

Dr. Lata Menon, Dy CEo and Principal, PHCASC

Prof. Amar Mange, PHCET

Dr. Pradeep Chaterjee, Principal, PHIMSR

Prof. Suchita Sayangi, Principal PHCA

Prof. Mamta Patil, Incharge Principal PHCER

(External)

Umesh Patil

Amit Gupta

Vivek Gaikwad

Sailesh Shrivastva

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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 unfailingly.

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 5561 students enrolled and 379 teaching faculty and staff members on its payroll. The Colleges offer various courses listed below:

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)

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 1**.

Floor wise Facilities of Campus

PHEC " A " Building ARTS SCIENCE AND COMMERCE, MMS, B.Ed, Sports office	
Ground Floor	Gymnasium, Offices, sports room, classrooms, Washrooms (Ladies and Gents)
First Floor	Store room, xerox center, computer labs, Chemistry Lab, Physics labs, 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)
Fifth Floor	Classrooms, washrooms (Gents and Ladies)
Sixth Floor	Classrooms, washrooms (Gents and Ladies)
Seventh Floor	Staff Room, Classrooms, Washrooms (Ladies and Gents)
Eighth Floor	AV Room, Classrooms, Washrooms (Ladies and Gents)
Ninth Floor	Auditorium

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)
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)

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 parlour room , office, classroom , washroom (Ladies and Gents)
Sixth Floor	Classrooms , Wash rooms (Ladies and Gents)
Seventh Floor	Classrooms , Wash rooms (Ladies and Gents)

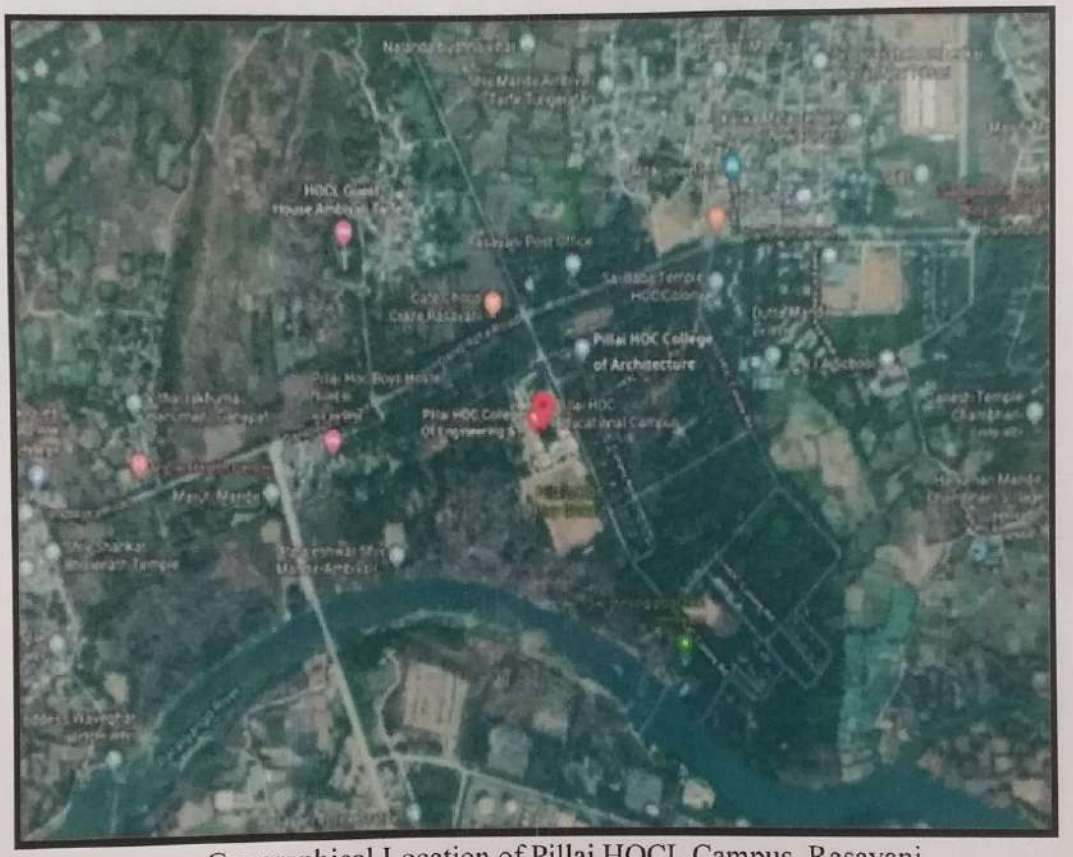
Eighth Floor	Classrooms , Wash rooms (Ladies and Gents)

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 Room, 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 a 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:

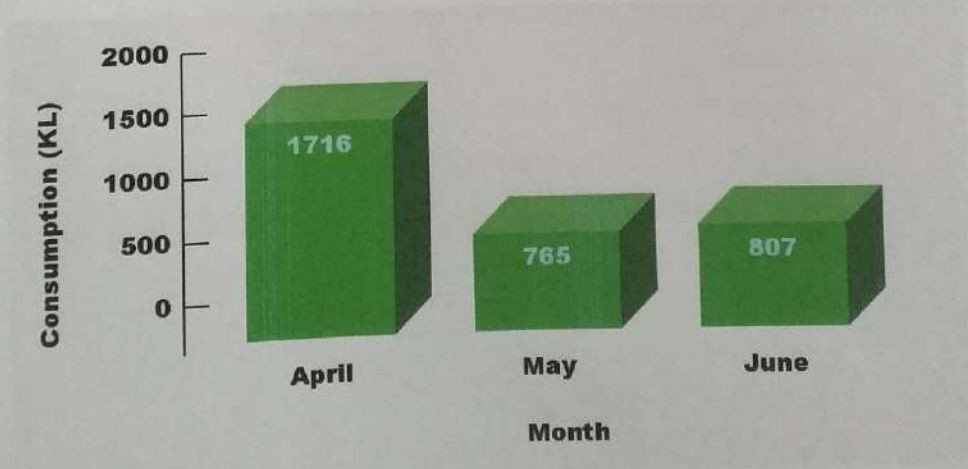
1. Exhaust to be cleaned and maintained.
2. Exhaust fans are installed only in the chemistry lab. More exhaust needs to be installed.
3. Only a few indoor plants were observed within the campus. Few artificial plants were observed in the campus that could be replaced by indoor plants.
4. Smoke detectors 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 4 KL/day. Total water consumption for 3 months April 2021 to June 2021 is 1096 KL/month. This calculates to approximately 5.6 L/Person/Day which is far below the standard norms.

The figure below shows the consumption of water for 3 months.

This low water consumption is due to lockdown in the pandemic. Referring and verifying to previous water receipts and audit report the water consumption was found 3739 KL/month (29 L/Person/day)



Water Consumption in Campus from April 2021 to June 2021

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

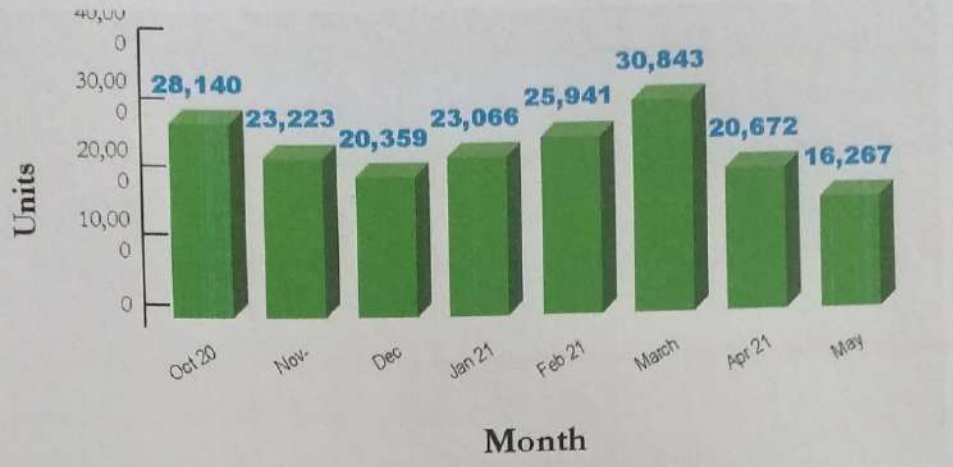
Signages near Cooler/Purifier

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 October 2020 to May 2021 is around 23563 KWh(units).



Monthly Energy Consumption from Oct 2020 to May 2021

The consumption is found to be too low because of lockdown in this pandemic. Going through the previous report and bills it is found that the average energy consumption is 53,220 KWh(units).

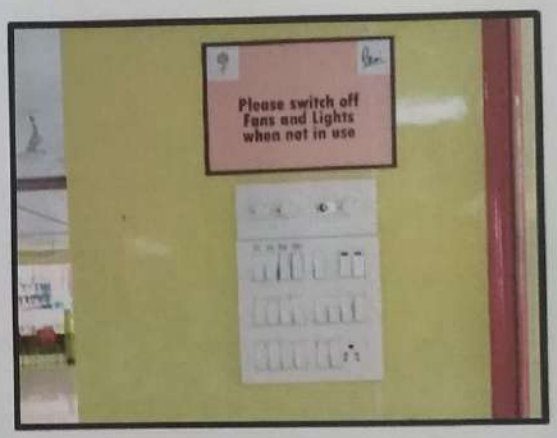
Major electricity consumption are as follows

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 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 rooftop. This energy is used for street lights within the campus.

2 Diesel Generators

Solar Panels

3.4.2 Temperature and Acoustic 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.

Composting Unit

Dustbin with Signages for solid waste collection

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.

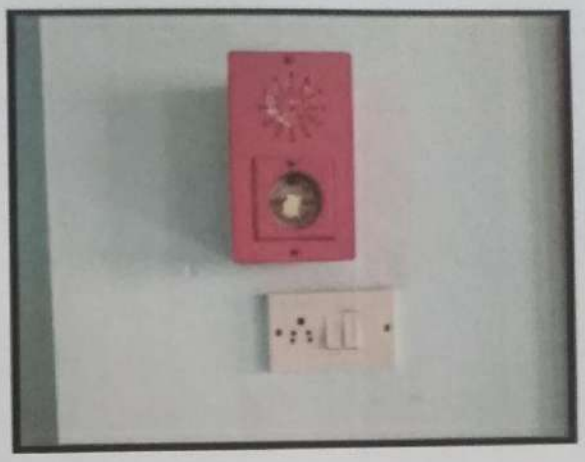
3.6 Building Maintenance

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 program should be conducted annually.



3.7 Initiatives by Institute for Green Management

Observations:

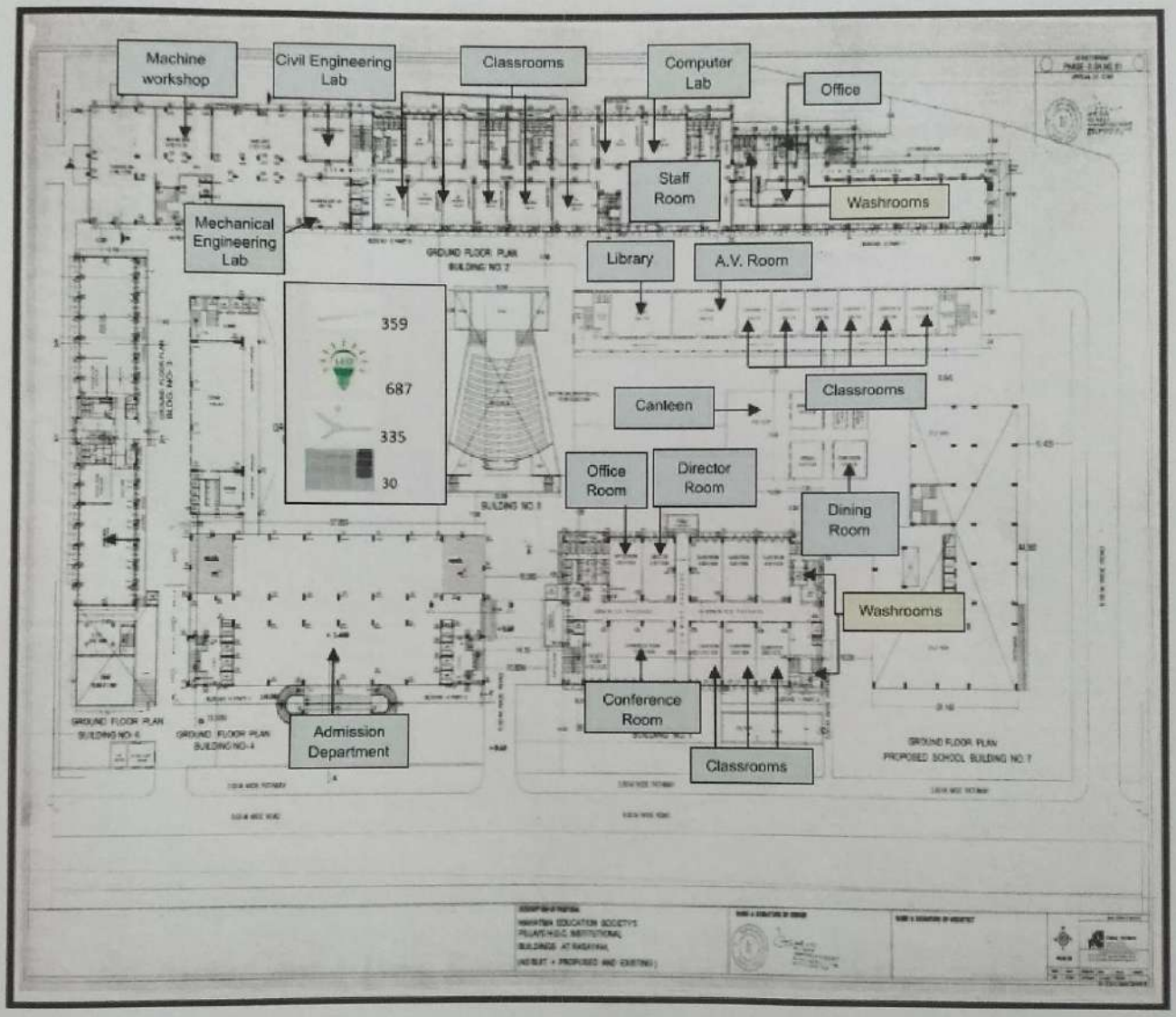
1. Campus has come up with many green initiatives.
2. Environment Management is included in the curriculum to increase awareness.
3. Nature Club organizes different events to increase green awareness among students throughout the year
4. NSS and Nature Club have started a "Know Green, Think Green" promotion.
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:

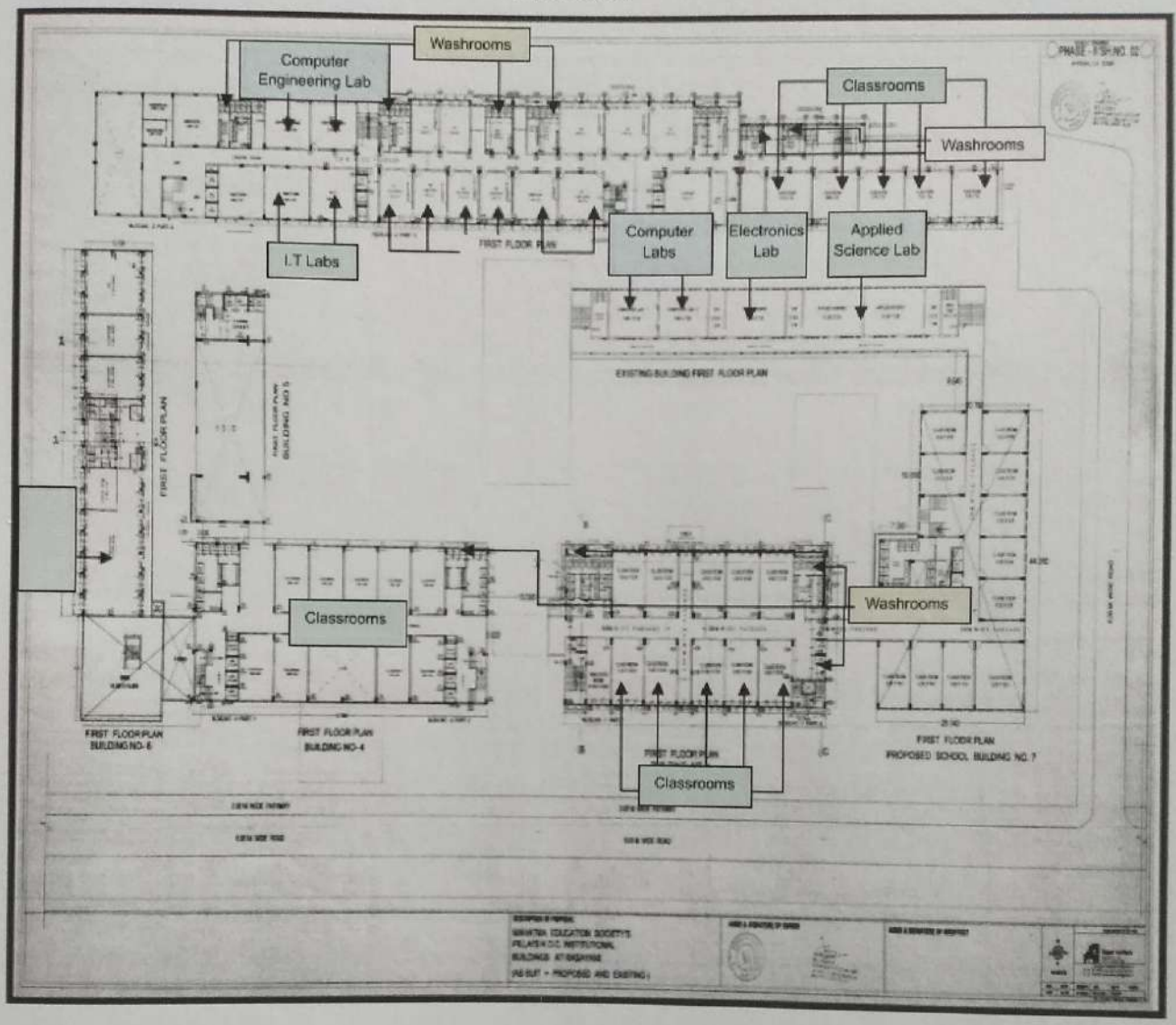
1. Vertical gardening on campus walls is recommended using indoor plants.
2. More webinars, workshops and outdoor activity can be initiated to increase the awareness.
3. Renovation of the cooking system in the canteen to save gas.
4. Establish a purchase policy that is energy saving and eco-friendly.
5. Replace incandescent and CFL lamps with LED lights.
6. Avoid plastic/thermocol 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

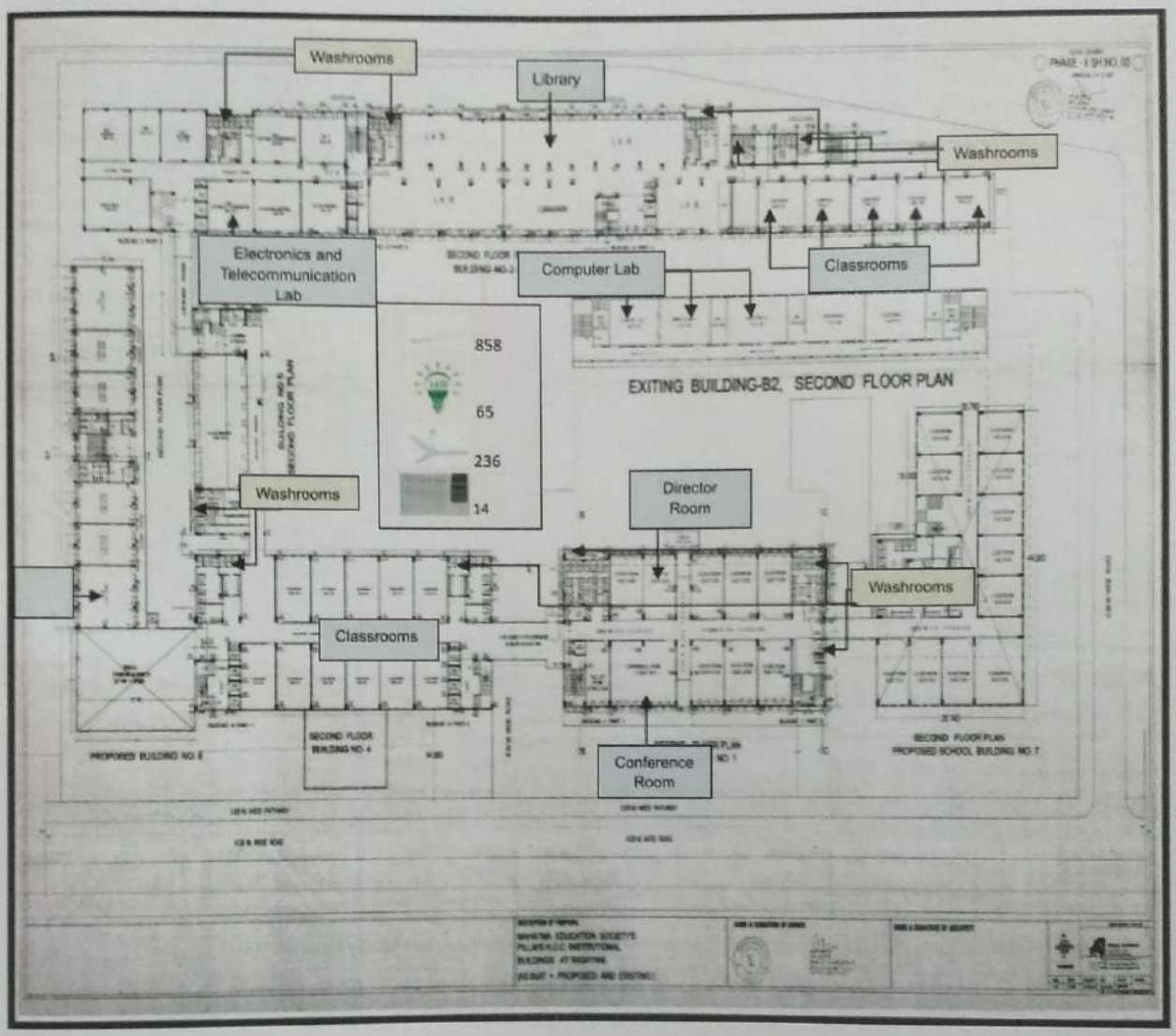
Ground Floor



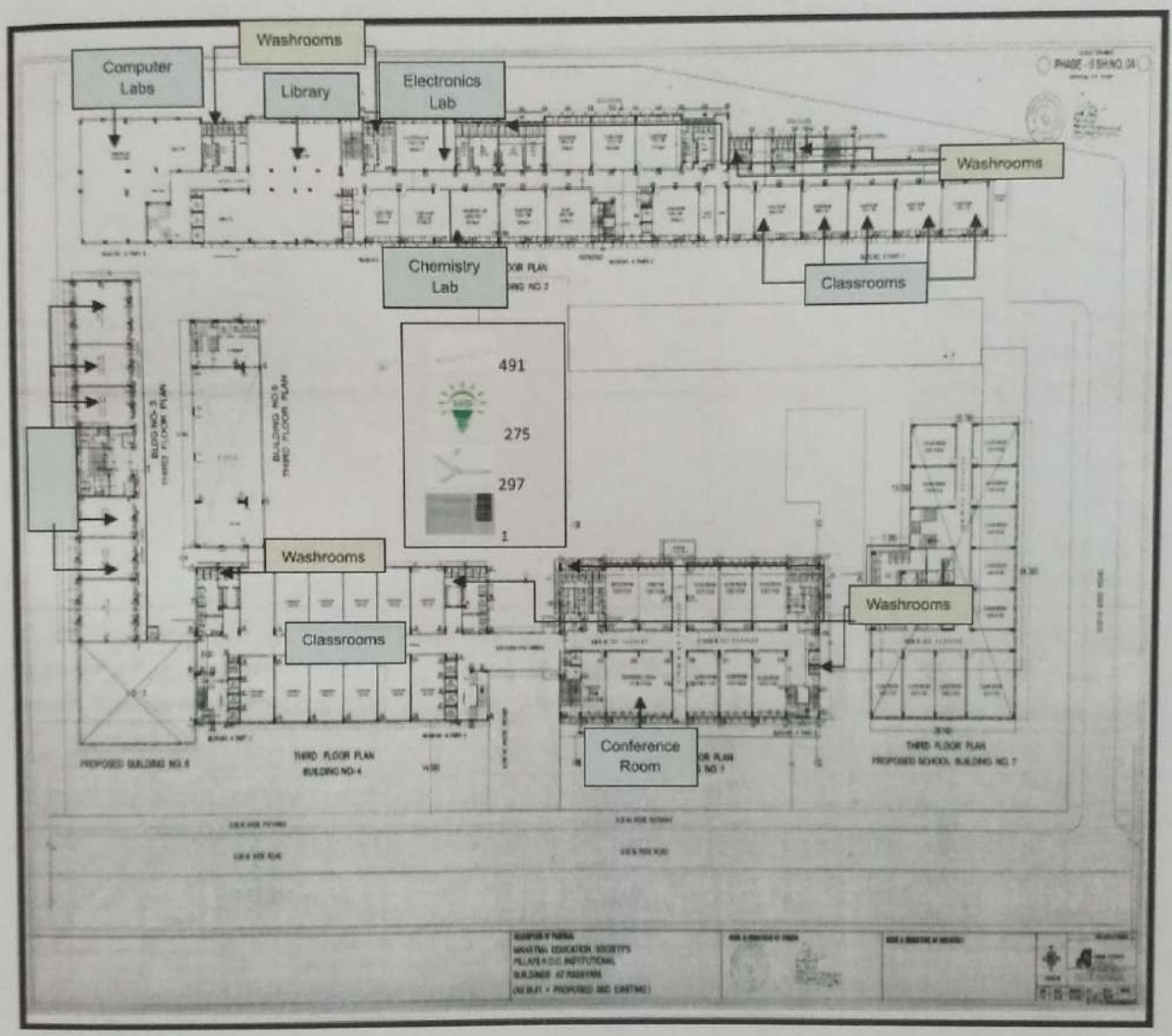
First Floor


Washrooms
Computer Engineering Lab
Classrooms
Washrooms
I.T Labs
Computer Labs
Electronics Lab
Applied Science Lab
Classrooms
Washrooms
Classrooms

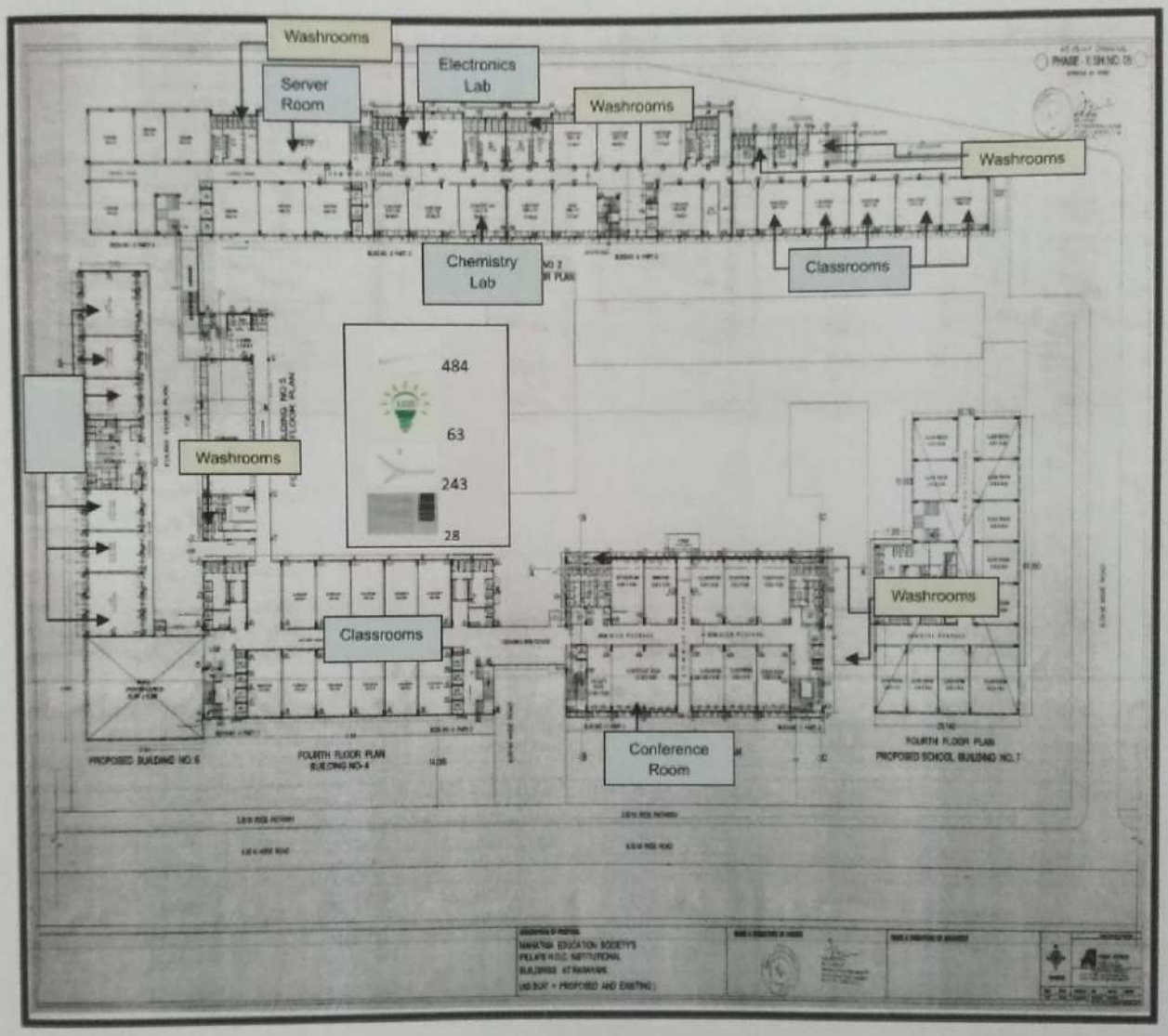
Second Floor



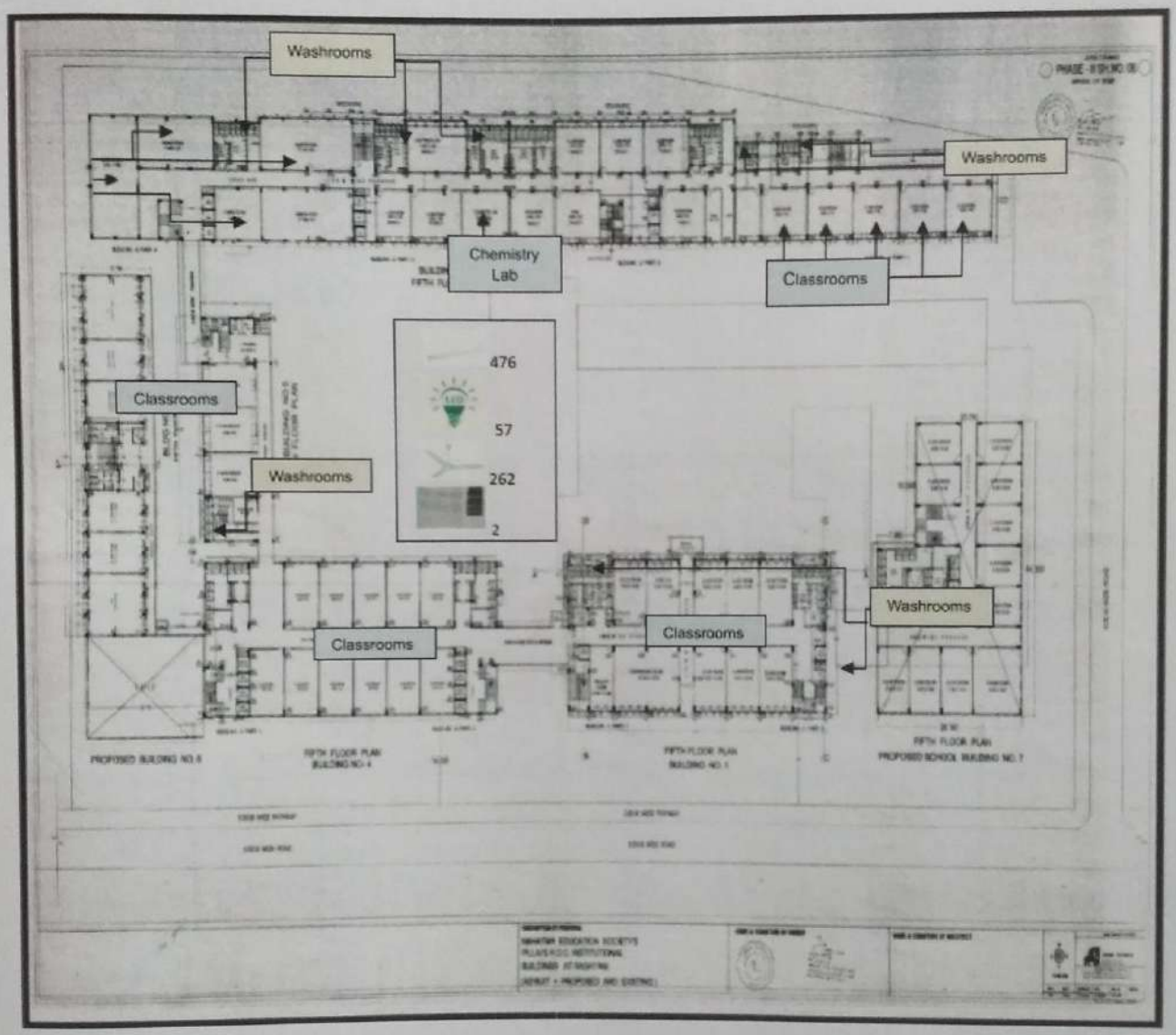
Third Floor


Washrooms
Computer Labs
Library
Electronics Lab
Washrooms
Chemistry Lab
Classrooms
491
275
297
1
Washrooms
Classrooms
Washrooms
Conference Room
THIRD FLOOR PLAN
BUILDING NO-4
THIRD FLOOR PLAN

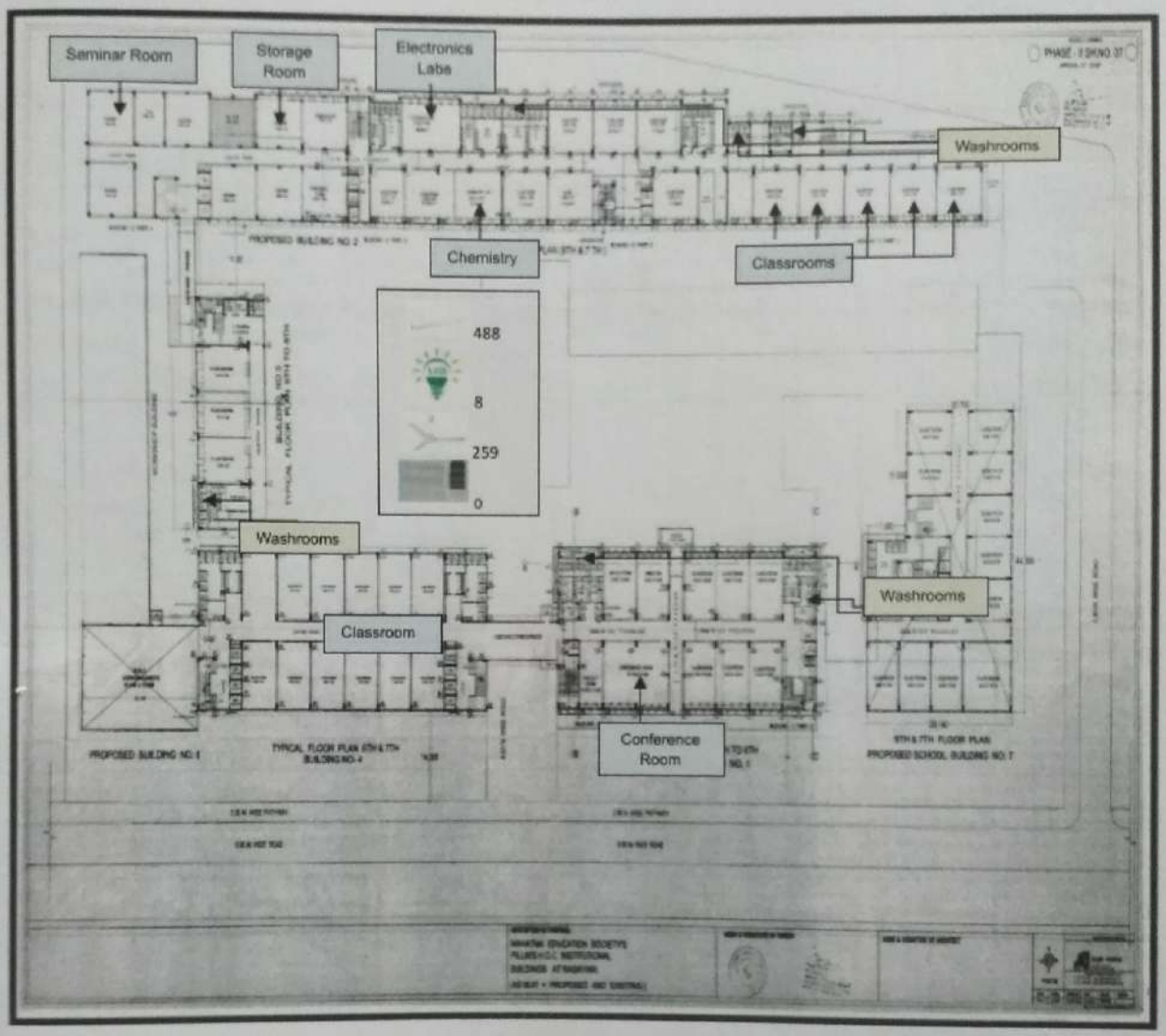
Fourth Floor



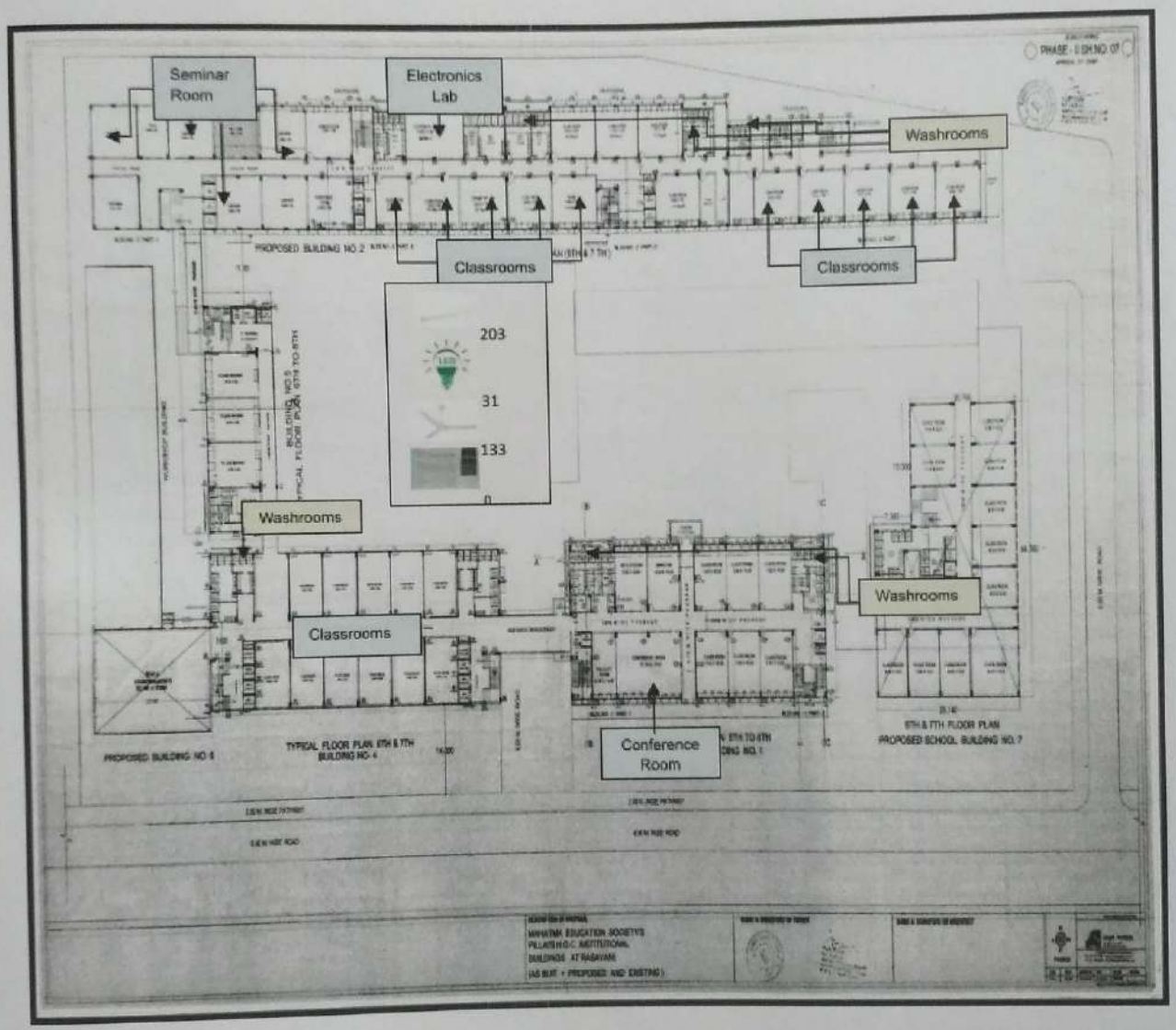
Fifth Floor


Washrooms
Washrooms
Chemistry Lab
Classrooms
476
57
262
2
Classrooms
Washrooms
Classrooms
Classrooms
Washrooms

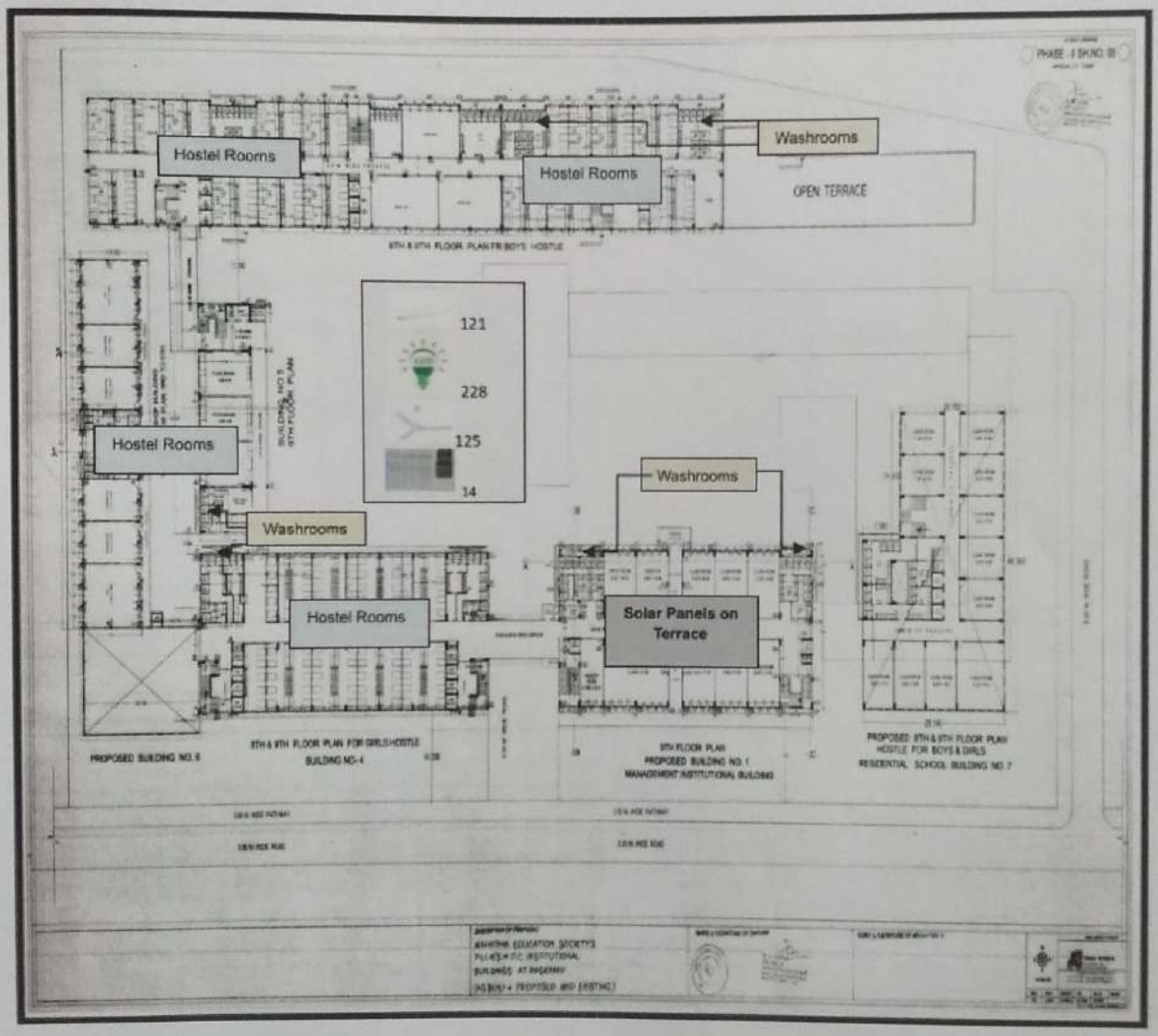
Sixth Floor


Seminar Room
Storage Room
Electronics Labs
Washrooms
Chemistry
Classrooms
488
8
259
0
Washrooms
Classroom
Washrooms
Conference Room

Seventh Floor



Ninth Floor


Hostel Rooms
Hostel Rooms
Washrooms
OPEN TERRACE
121
228
125
14
Hostel Rooms
Washrooms
Washrooms
Hostel Rooms
Solar Panels on Terrace

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 elegan	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
15	Staff Room	8	15	5
16	PHCACS Office	1	1	1
17	PHCACS Exam Cell	1	1	1
18	PHCACS Faculty	2	8	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

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	x
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	✔

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	x

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	✔

7. Checklist for Green Management

Sr. No.	Green program	Availability
1	Availability of e-books/ magazines and online resource	x
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.

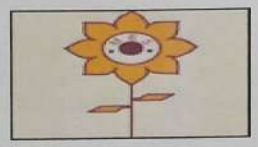
We reserve the right to refuse to open or access any equipment in cases where there is insufficient PPE (personal protective equipment) available or an insufficient protective boundary for nearby personnel.

Electrical Energy Audit Report

For

MAHATMA EDUCATION SOCIETY

RASAYANI-HOC



Presented By

RB ENERGY CONSULTANCY

Conducted on – 16 AUGUST-2021

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).
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2	Specifications of Instruments used	4
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4	Recommendations	6
5	Report Summary	7
6	Main Power Panels	8
7	General Observations & Recommendations	15
8	General Suggestions	19
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1. INSPECTION IDENTIFICATION

Client Name	MAHATMA EDUCATION SOCIETY
Site Location	MAHATMA EDUCATION SOCIETY (RASAYANY)
Performed By	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,

3. INTRODUCTION

This report details the Electrical Safety Audit activity conducted for 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

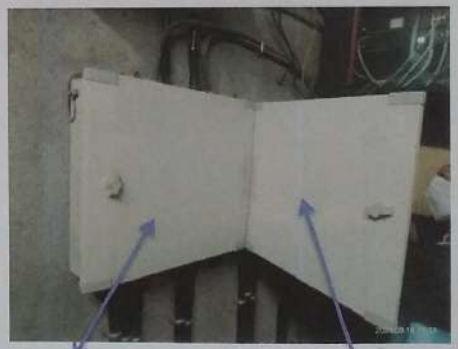
The actions to be taken are completely on the client and the audit company shall not be responsible for it.

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.

5. REPORT SUMMARY

ote: - 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.

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



eatment charts not displayed in panel room, Fire schematic not mentioned at of DB

Electric room is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry"

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

1. Electrical single diagram is not found,
2. Emergency Contact Details

Fire extinguisher are provided but 5 ft. on wall mounted

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. Without lug wire conductor is connected to MCB.	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
		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	

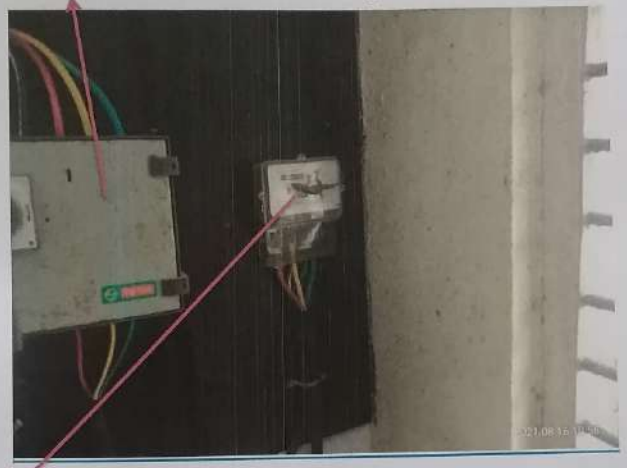
Cables are gland properly at terminations.

O/G cable tagging is required

1- Electrical Insulating mat is not founding on flooring.

2- Fire extinguisher are provided but 5 ft. on wall mounted

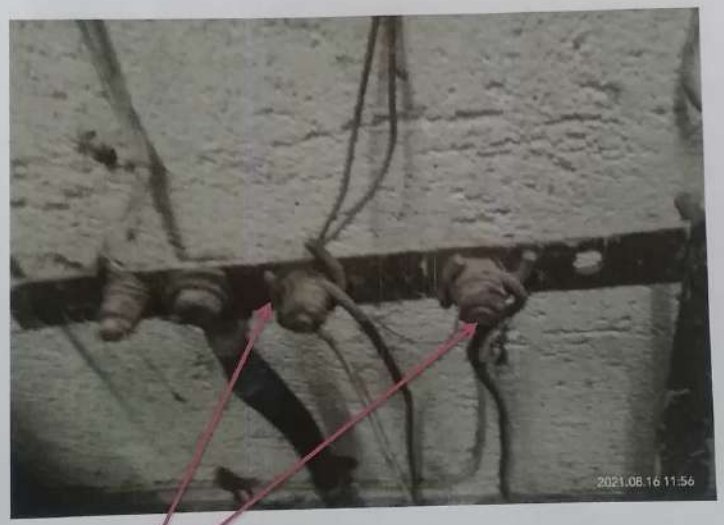
1- Electric DB is labeled with "Electric Room" "Danger 440 Volts" "Restricted Entry"



2- Live lizard found on main electric meter

Fire extinguisher was not renewing

Unwanted material is stored in electrical & fire panel area



Rusted earthing bolts

Location : Office are		
Parameters	Observations	Remarks
Fire Extinguisher		- Need to hang on wall at 5 feet [only 1]
MCP/BGU	√	Found ok
Observation on Fire Extinguisher	√	Not renewed
Signage's	√	Not Found
Emergency Contact Details	×	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	Must Required
Healthiness of System	√	Found ok
Emergency Lighting	X	Must Required
First Aid Kit	√	Found ok
Electric Shock Treatment Chart	×	Must Required

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 anddated.	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.

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 enable 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

Project: MAHATMA EDUCATION SOCIETY (RASAYANY)

Year	Month	Day	2nd shift Engineer	2nd 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.

Signature of (respective agency)

Signature of person authorizing the Permit

Name:
Designation:

Date:

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 RB Energy Consultancy

Mahatma Education Society's
Pillai HOCL Campus, Rasayani

Green Audit Report

Presented By
RB ENERGY CONSULTANCY

Academic Year 2020-21

Green Audit Report of Mahatma Education Society's HOCL, Rasayani campus was conducted by RB Energy Consultancy Services and its team on **1st and 2nd September, 2021.**

Green Audit report states the initiatives taken by institute towards environment sustainability

Team RB Energy Consultancy

Green Audit Assessment Team

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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 unfailingly.

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 (PHCASC) (2008),

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

The Colleges offer various courses listed below:

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)

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

- 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.)
- Masters of Commerce in Accountancy (M.Com.)
- Masters of Science in Information Technology (M.Sc. I.T.)

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 1**.

Floor wise Facilities of Campus

PHEC " A " Building ARTS SCIENCE AND COMMERCE, MMS, B.Ed, Sports office	
Ground Floor	Gymnasium, Offices, sports room, classrooms, Washrooms (Ladies and Gents)
First Floor	Store room, xerox center, computer labs, Chemistry Lab, Physics labs, 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)
Fifth Floor	Classrooms, washrooms (Gents and Ladies)
Sixth Floor	Classrooms, washrooms (Gents and Ladies)

Seventh Floor	Staff Room, Classrooms, Washrooms (Ladies and Gents)
Eighth Floor	AV Room, Classrooms, Washrooms (Ladies and Gents)
Ninth Floor	Auditorium
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)
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)

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 parlour room , office, classroom , washroom (Ladies and Gents)
Sixth Floor	Classrooms , Wash rooms (Ladies and Gents)
Seventh Floor	Classrooms , Wash rooms (Ladies and Gents)
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,

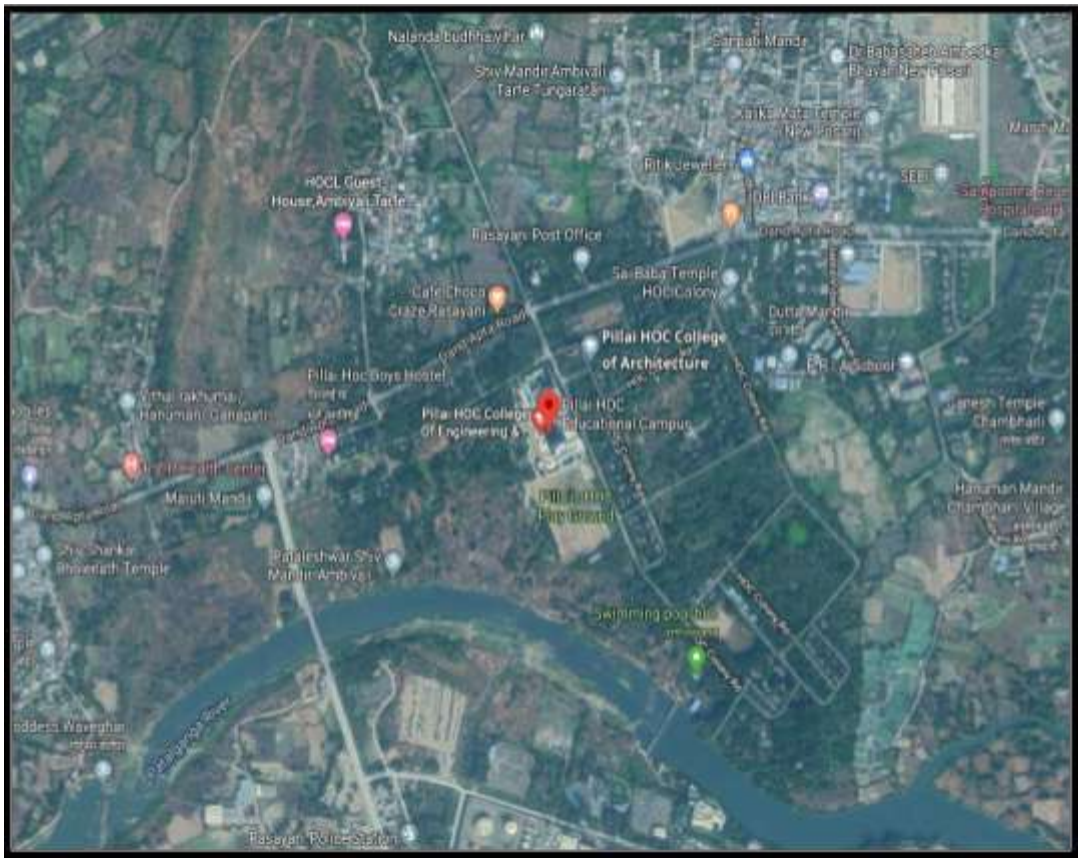
	Electronics Labs, Office Room, HOD Room, and Faculty Room
Fifth Floor	Seminar Rooms, Ladies' and Gents' Toilets, Electronics Lab, Classroom, Chemistry Lab, Staff Room, Office Room, and HoD Room
Sixth Floor	Classrooms, Ladies' and Gents' Toilets, Seminar Room, Conference Room, Electronic Labs, Staff Room, 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 a 14.23 acre 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**

Good Daylight in the Classroom

Exhaust Fan in Chemical Laboratory and good ceiling height

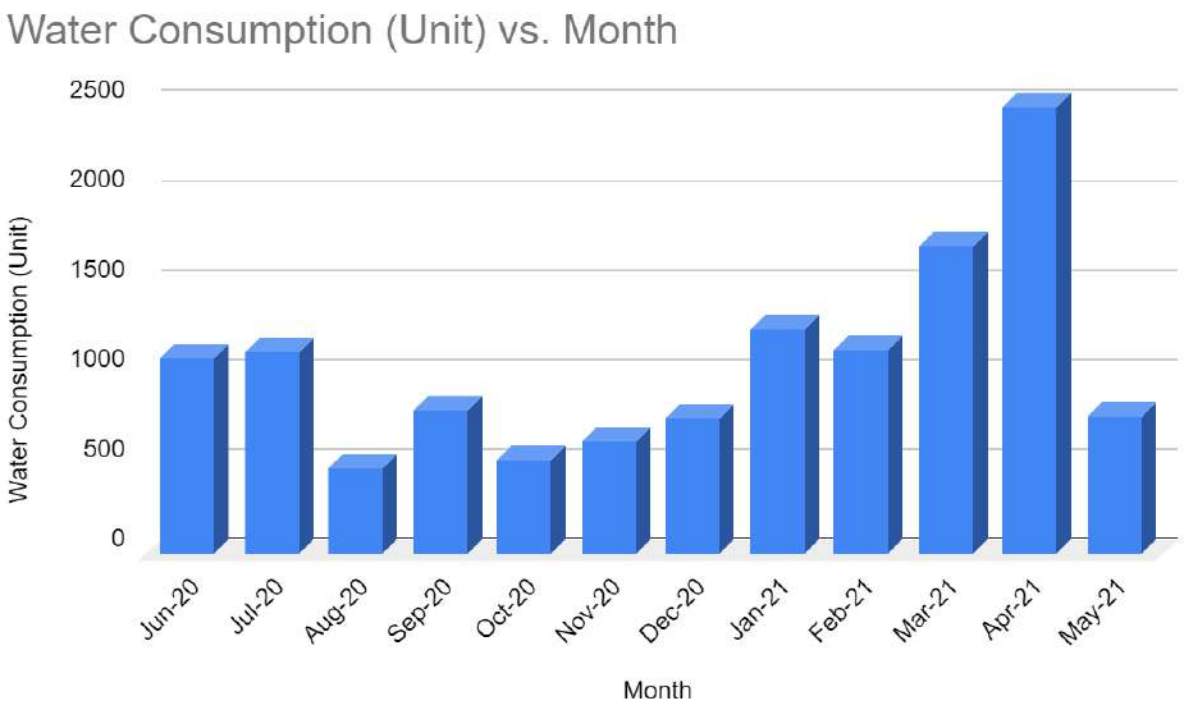
Recommendations:

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 35KL/day. Total water consumption for 12 months June 2020 to May 2021 is **1060 KL/month**.

The figure below shows the consumption of water for 12 months.



(Water Consumption in Campus from June 2020 to May 2021)

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

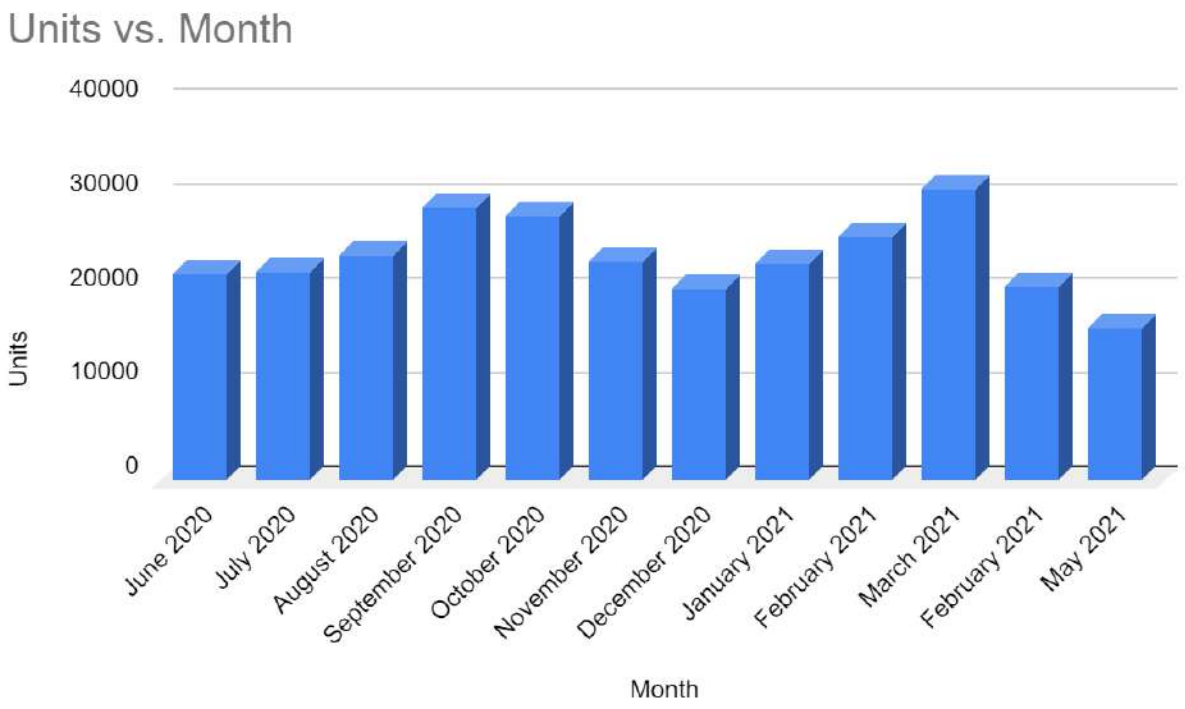
Signages near Cooler/Purifier

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 average consumption of electricity per month from June 2020 to May 2021 is around **23780 KWh(units)**.



(Monthly Energy Consumption from June 2020 to May 2021)

The consumption is found to be too low because of lockdown in this pandemic. 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.

(First Aid Box)

(Air Conditioned installed in Lab)

(Signages for energy conservation)

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 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 rooftop. This energy is used for street lights within the campus.

2 Diesel Generators

Solar Panels

3.4.2 Temperature and Acoustic 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.

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.

Composting Unit

Dustbin with Signages for solid waste collection

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 program should be conducted annually.

Fire extinguisher and fire alarm

3.7 Initiatives by Institute for Green Management

Observations:

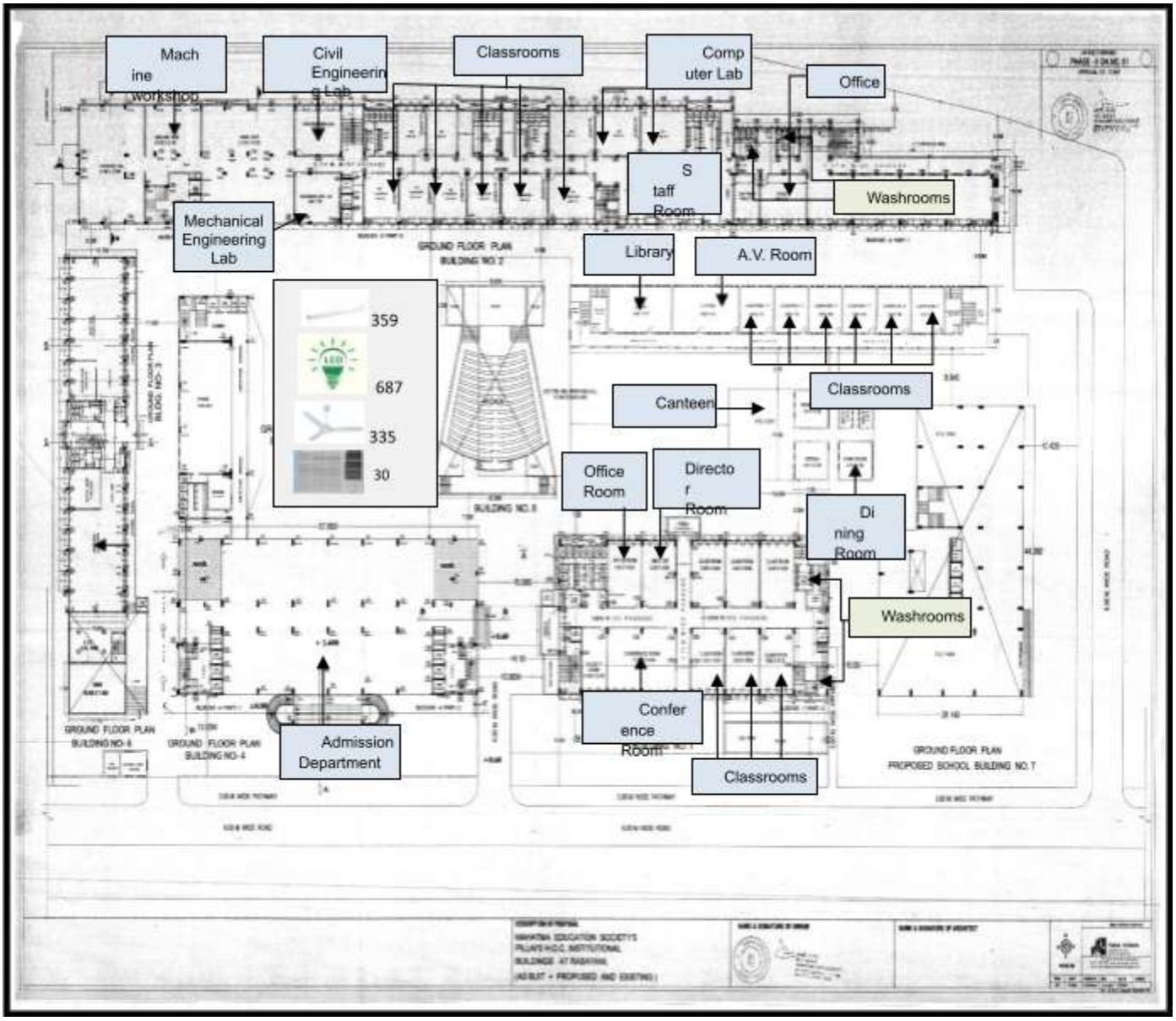
1. Campus has come up with many green initiatives.
2. Environment Management is included in the curriculum to increase awareness.
3. Nature Club organizes different events to increase green awareness among students throughout the year
4. Campus has installed rain water harvesting system
5. Campus has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

Recommendations:

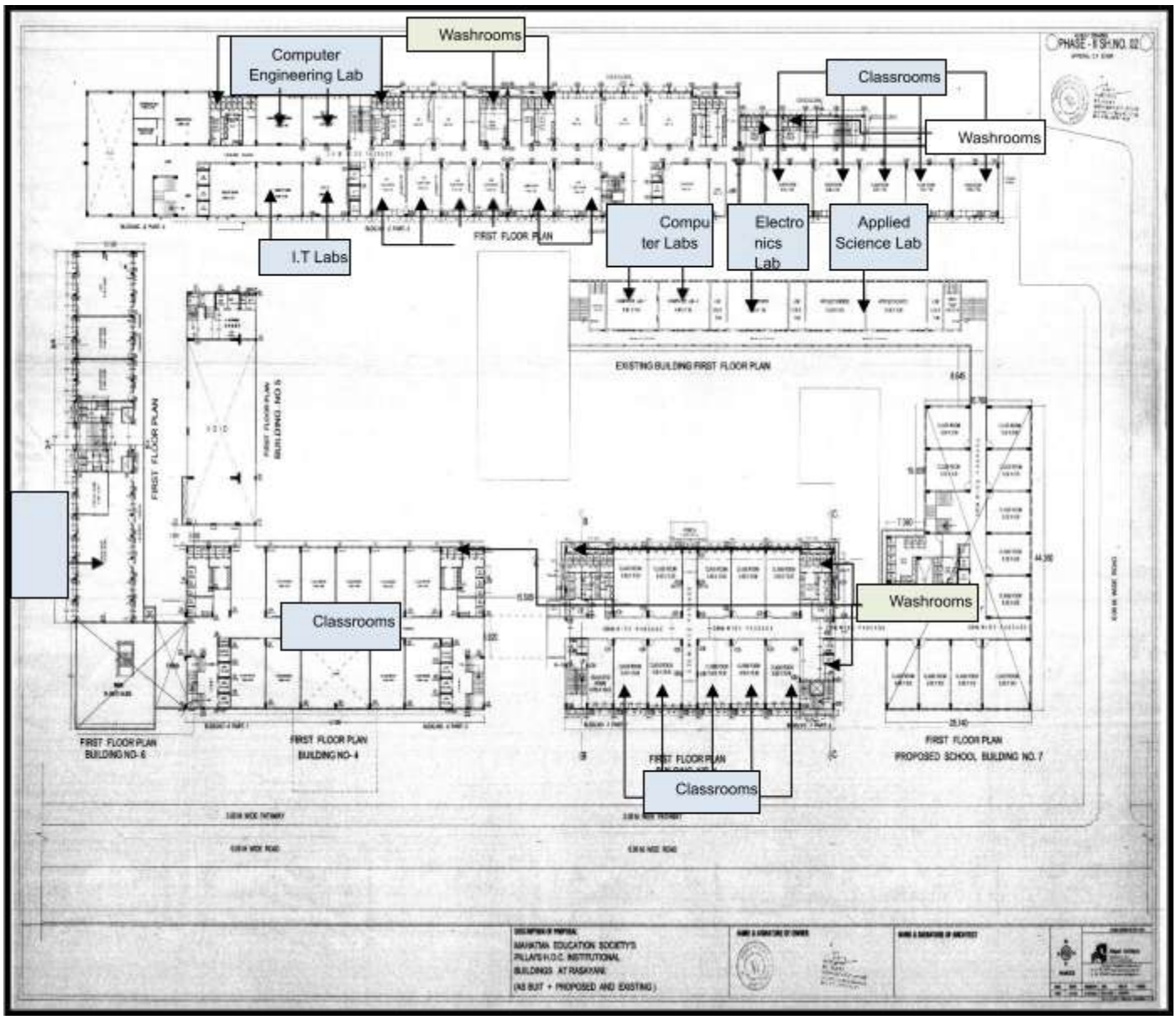
1. Vertical gardening on campus walls is recommended using indoor plants.
2. More webinars, workshops and outdoor activity can be initiated to increase the awareness.
3. Renovation of the cooking system in the canteen to save gas.
4. Establish a purchase policy that is energy saving and eco-friendly.
5. Replace incandescent and CFL lamps with LED lights.
6. Avoid plastic/thermocol 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

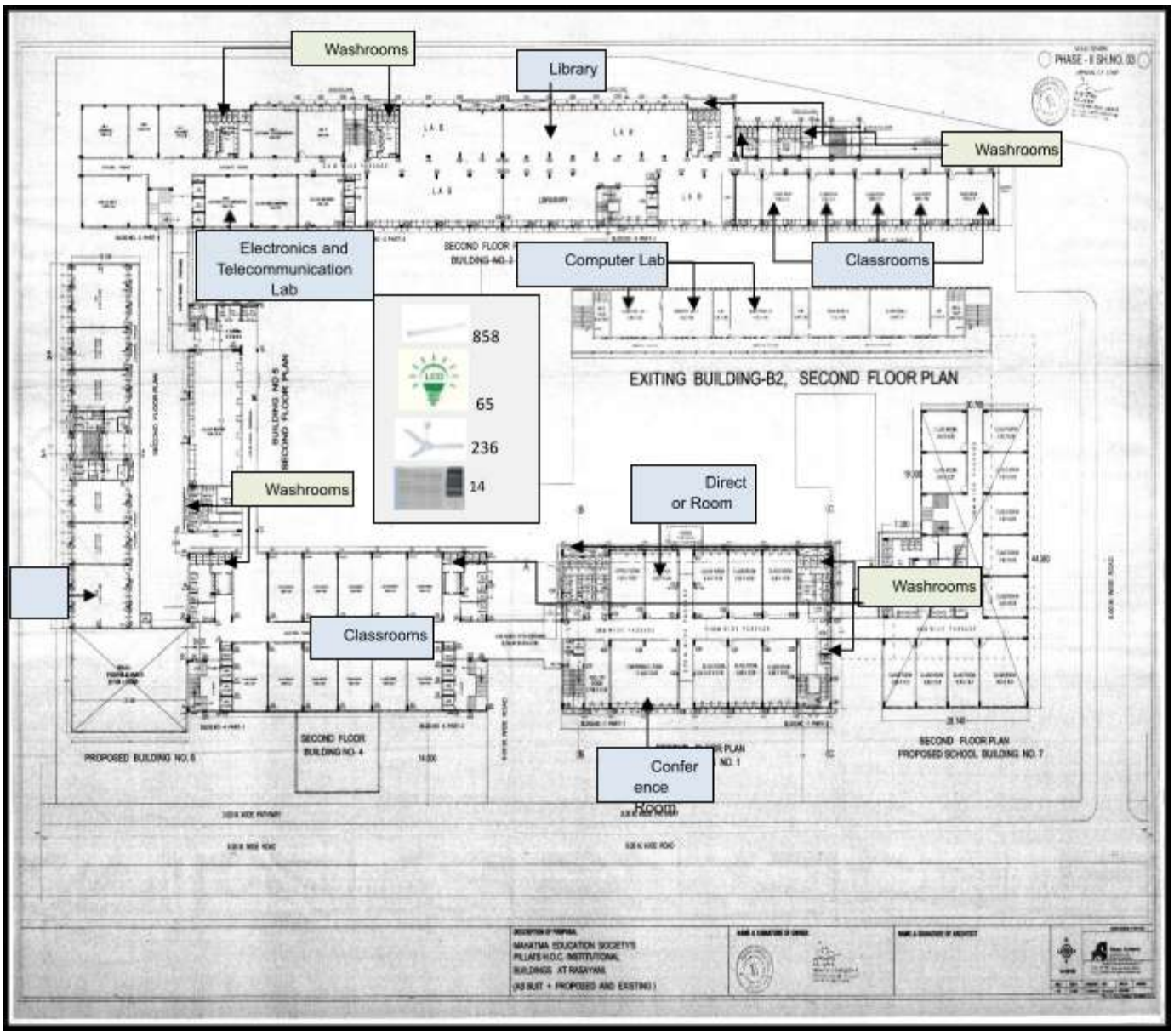
Ground Floor



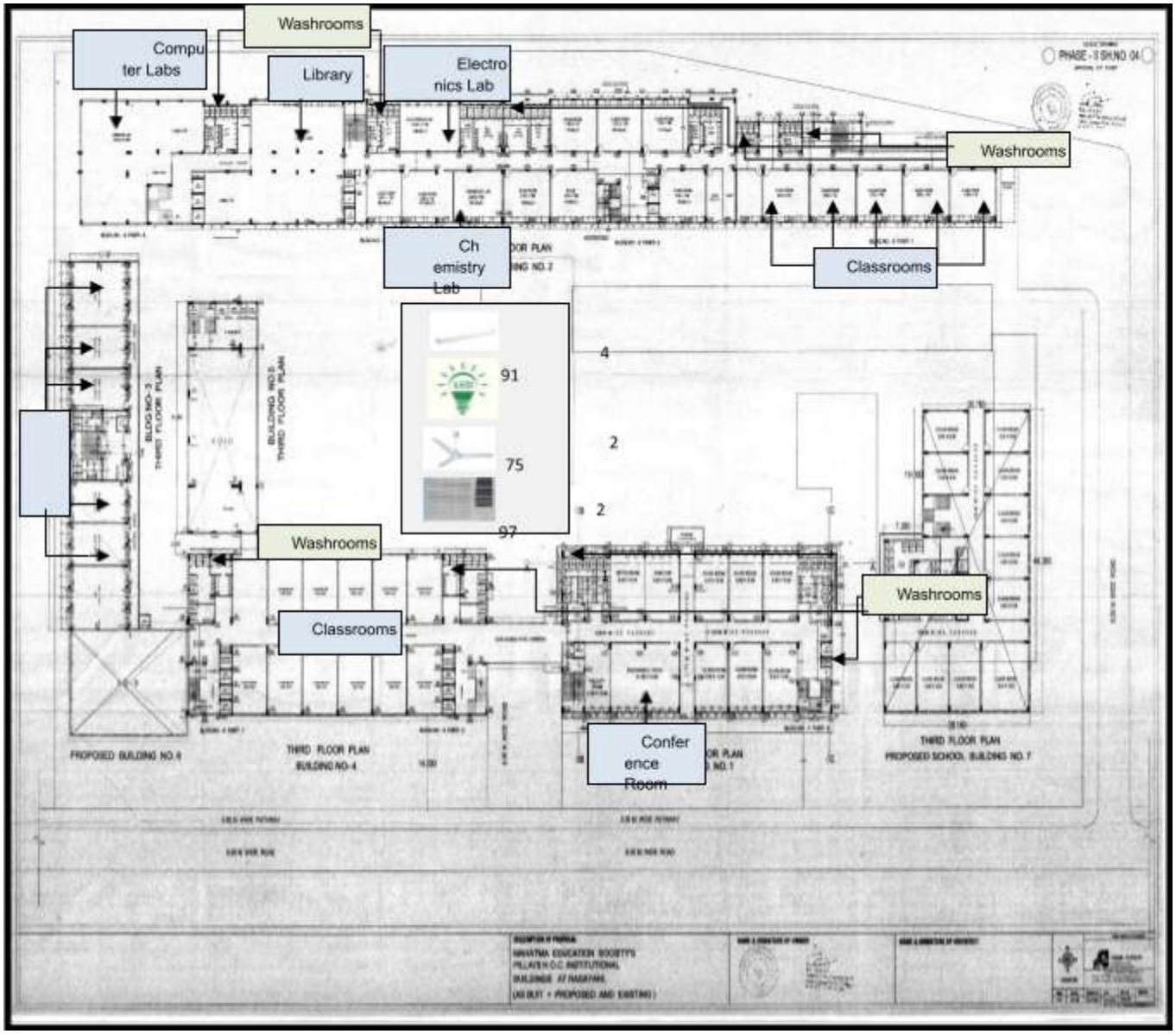
First Floor


Washrooms
Computer Engineering Lab
Classrooms
Washrooms
I.T Labs
Compu ter Labs
Electro nics Lab
Applied Science Lab
EXISTING BUILDING FIRST FLOOR PLAN
FIRST FLOOR PLAN
Classrooms
Washrooms
Classrooms
FIRST FLOOR PLAN BUILDING NO- 6
FIRST FLOOR PLAN BUILDING NO- 4
FIRST FLOOR PLAN
FIRST FLOOR PLAN PROPOSED SCHOOL BUILDING NO. 7

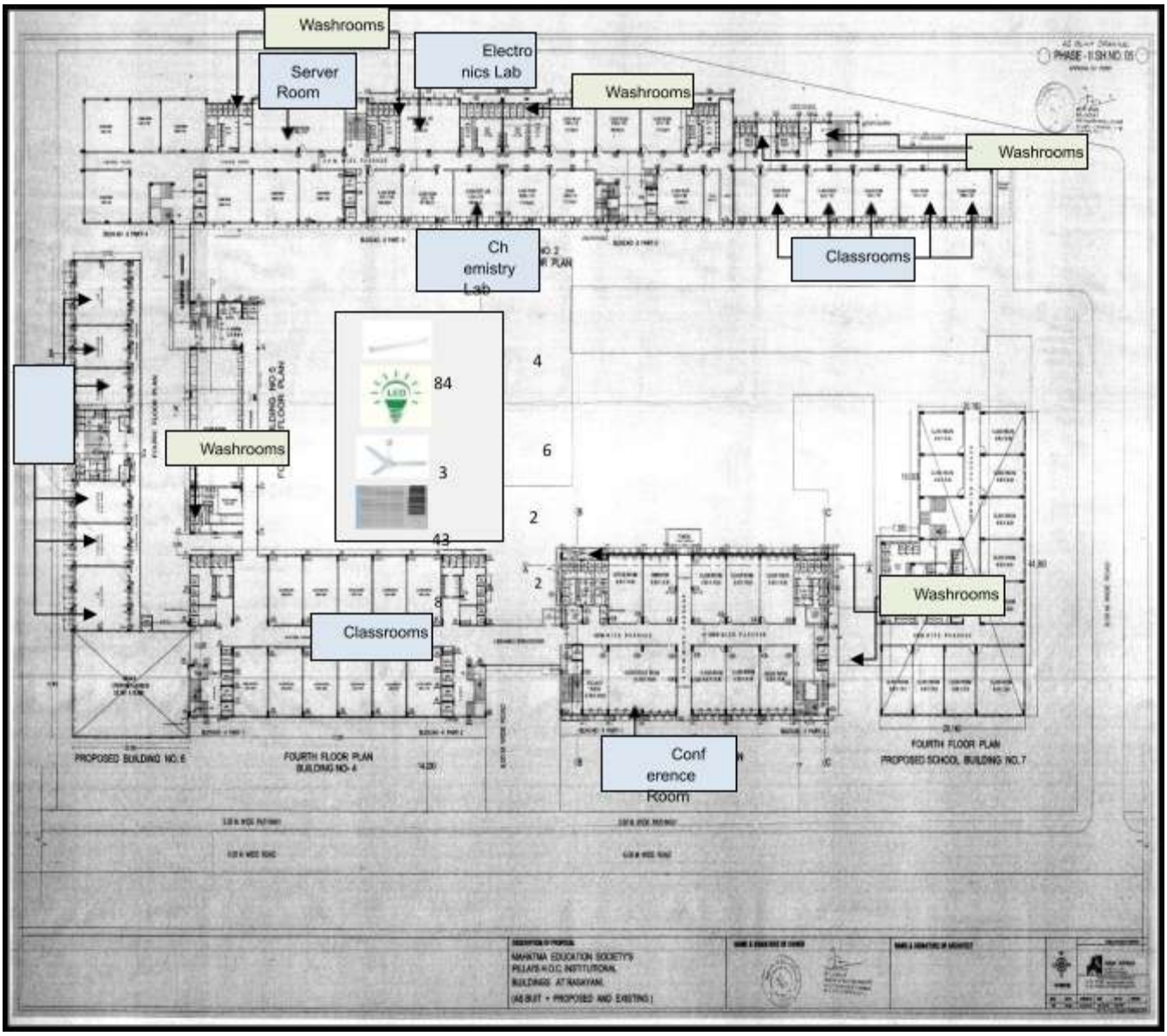
Second Floor



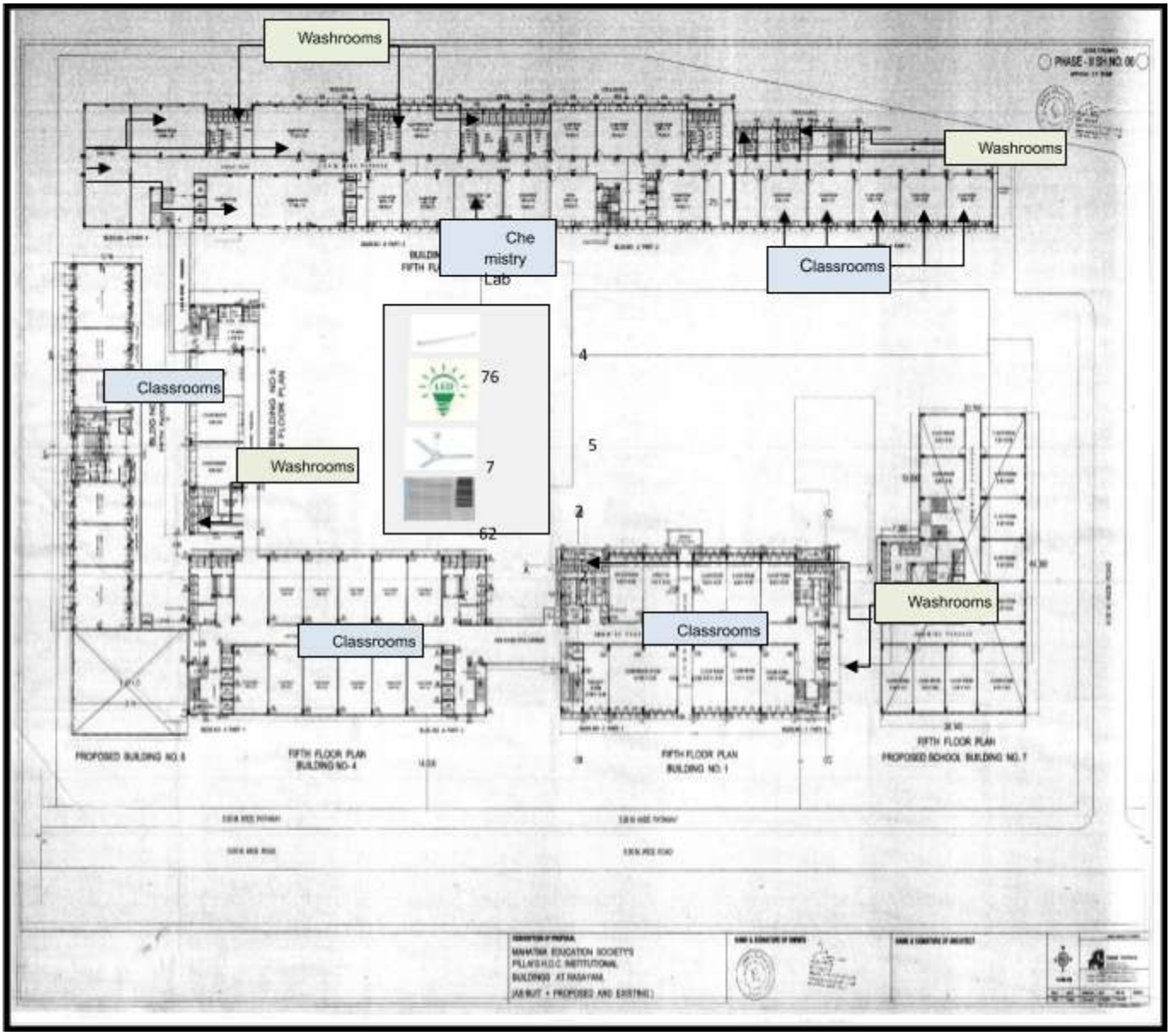
Third Floor


Washrooms
Compu ter Labs
Library
Electro nics Lab
Washrooms
Ch emistry Lab
Classrooms
91
75
97
4
2
2
Washrooms
Classrooms
Washrooms
Confer ence Room
THIRD FLOOR PLAN
BUILDING NO-4
THIRD FLOOR PLAN
PROPOSED SCHOOL BUILDING NO. 7
PROPOSED BUILDING NO.4

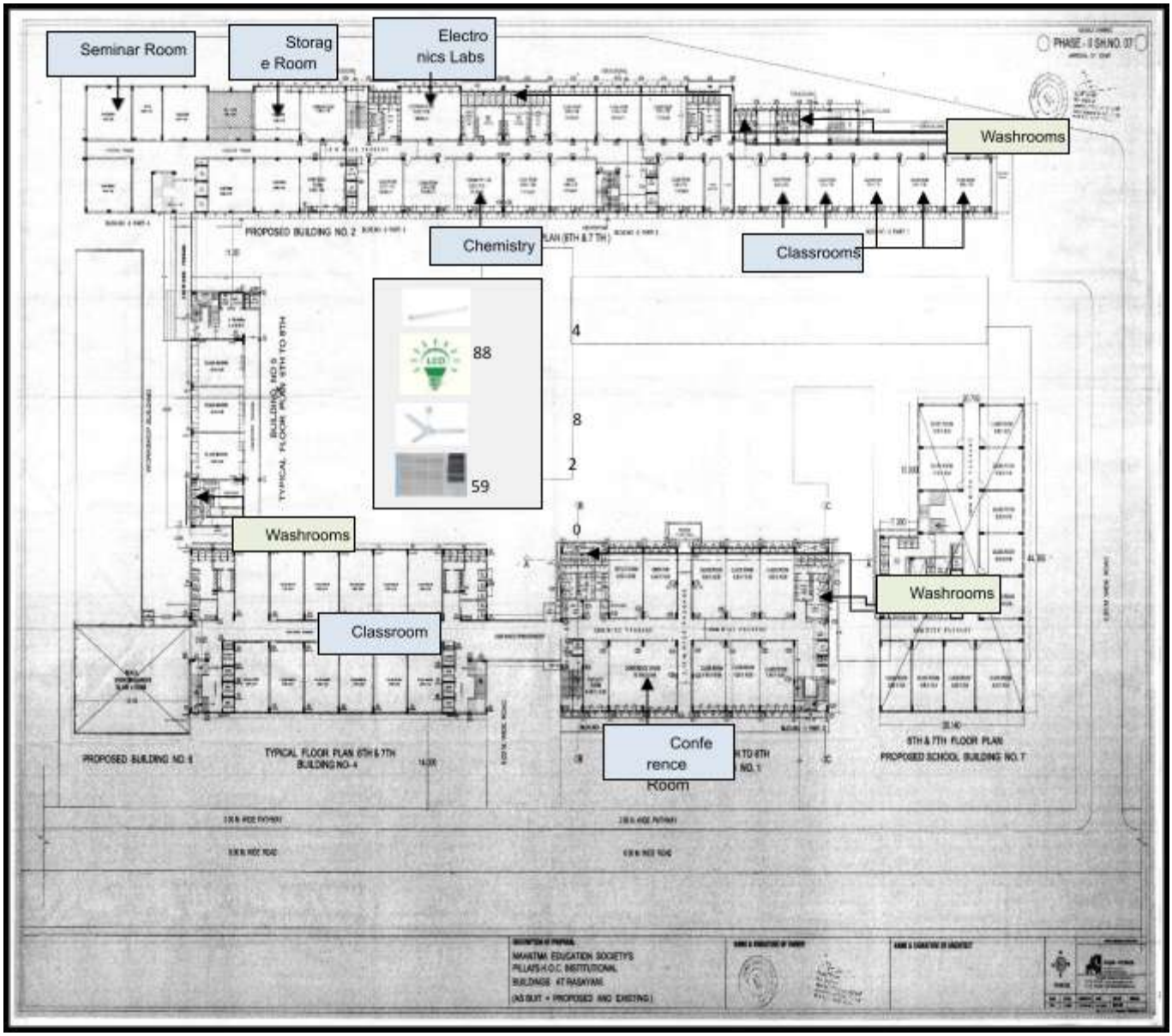
Fourth Floor



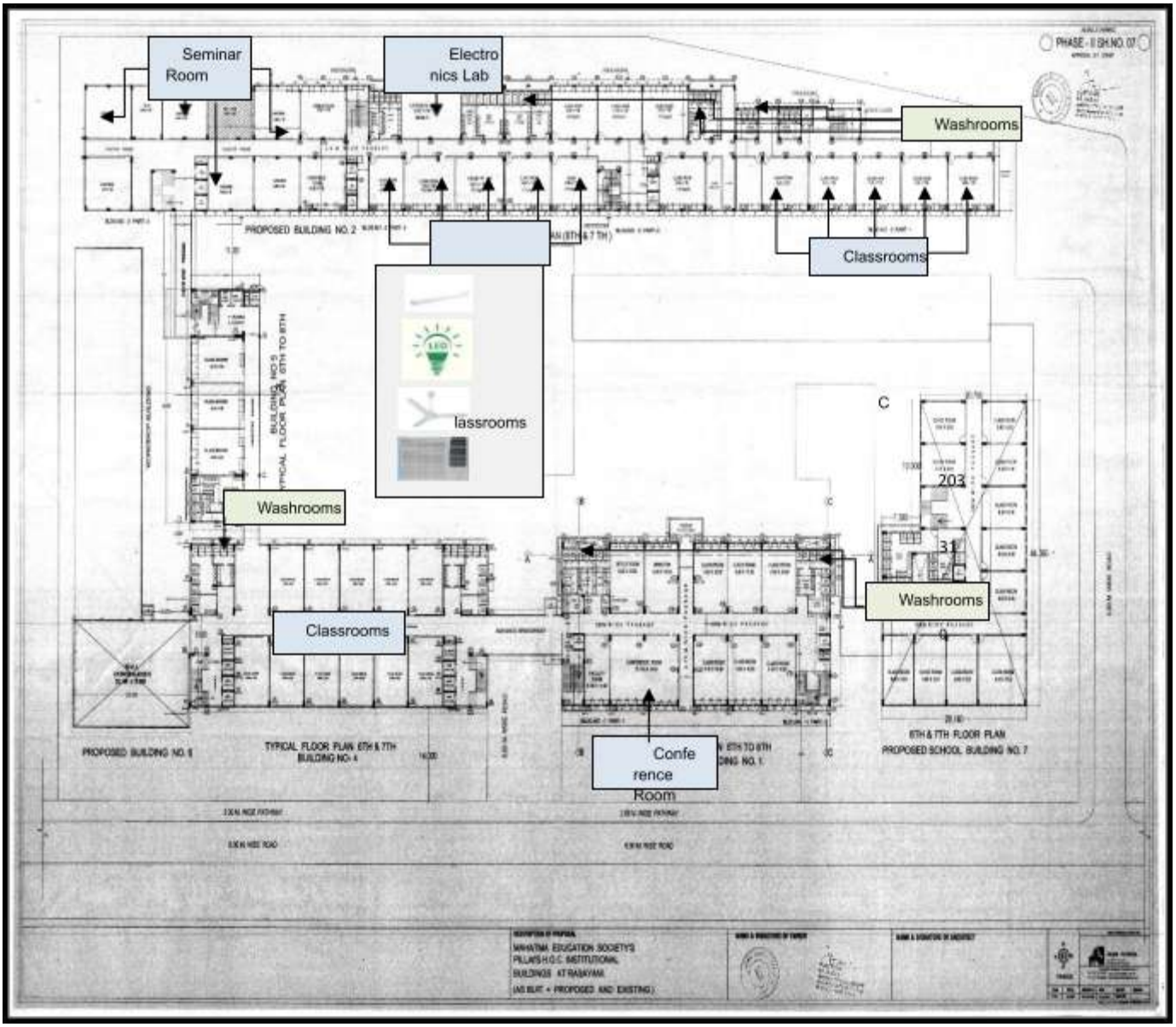
Fifth Floor


Washrooms
Washrooms
Che
mistry
Lab
Classrooms
Classrooms
76
7
62
4
5
2
Washrooms
Classrooms
Classrooms
Washrooms
FIFTH FLOOR PLAN
BUILDING NO. 1
FIFTH FLOOR PLAN
PROPOSED SCHOOL BUILDING NO. 7

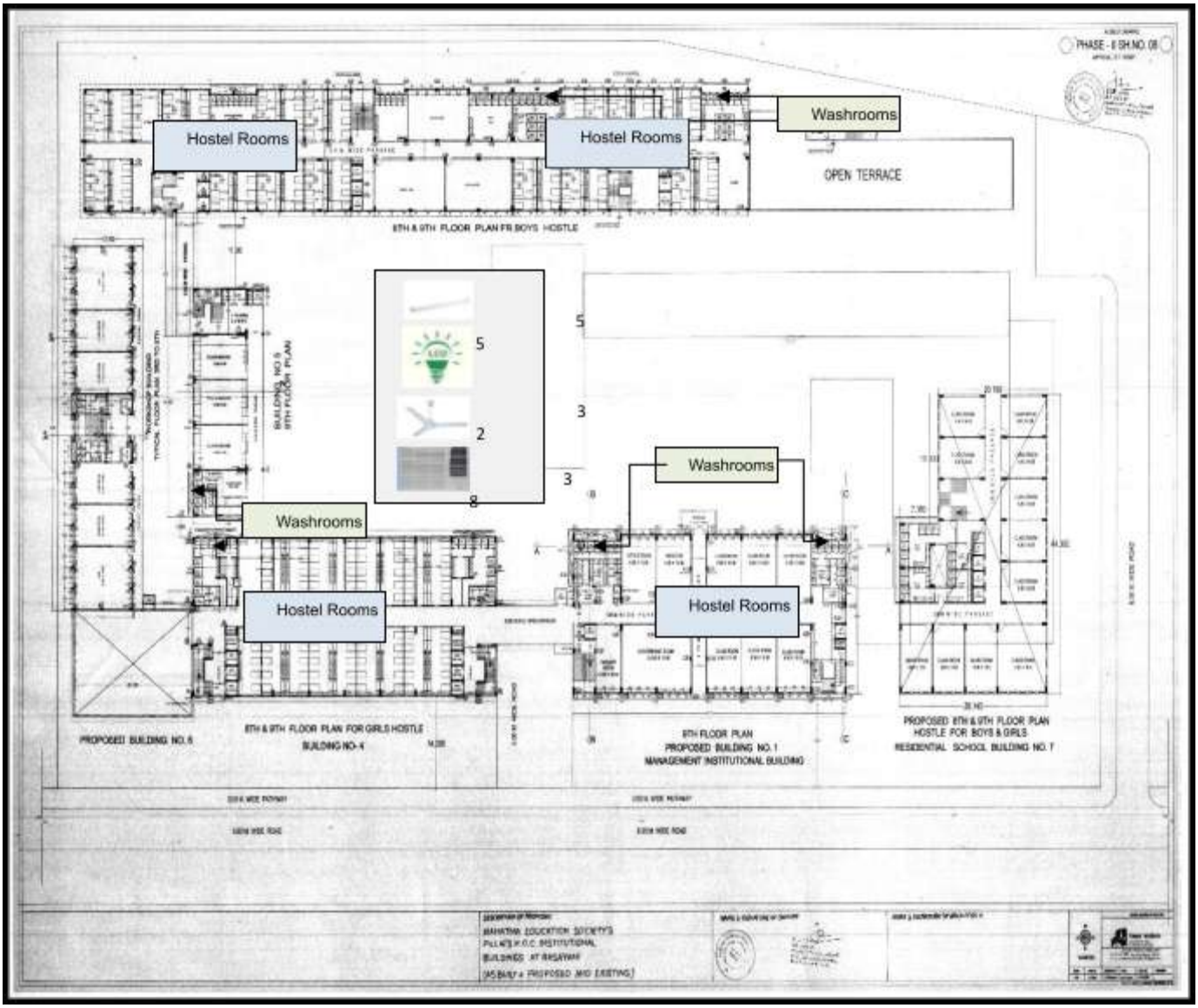
Sixth Floor


Seminar Room
Storag e Room
Electro nics Labs
Washrooms
Chemistry
Classrooms
88
59
Washrooms
Classroom
Washrooms
Confe rence Room
PROPOSED BUILDING NO. 6
TYPICAL FLOOR PLAN (5TH & 7TH BUILDING NO-4
8TH & 7TH FLOOR PLAN PROPOSED SCHOOL BUILDING NO.1

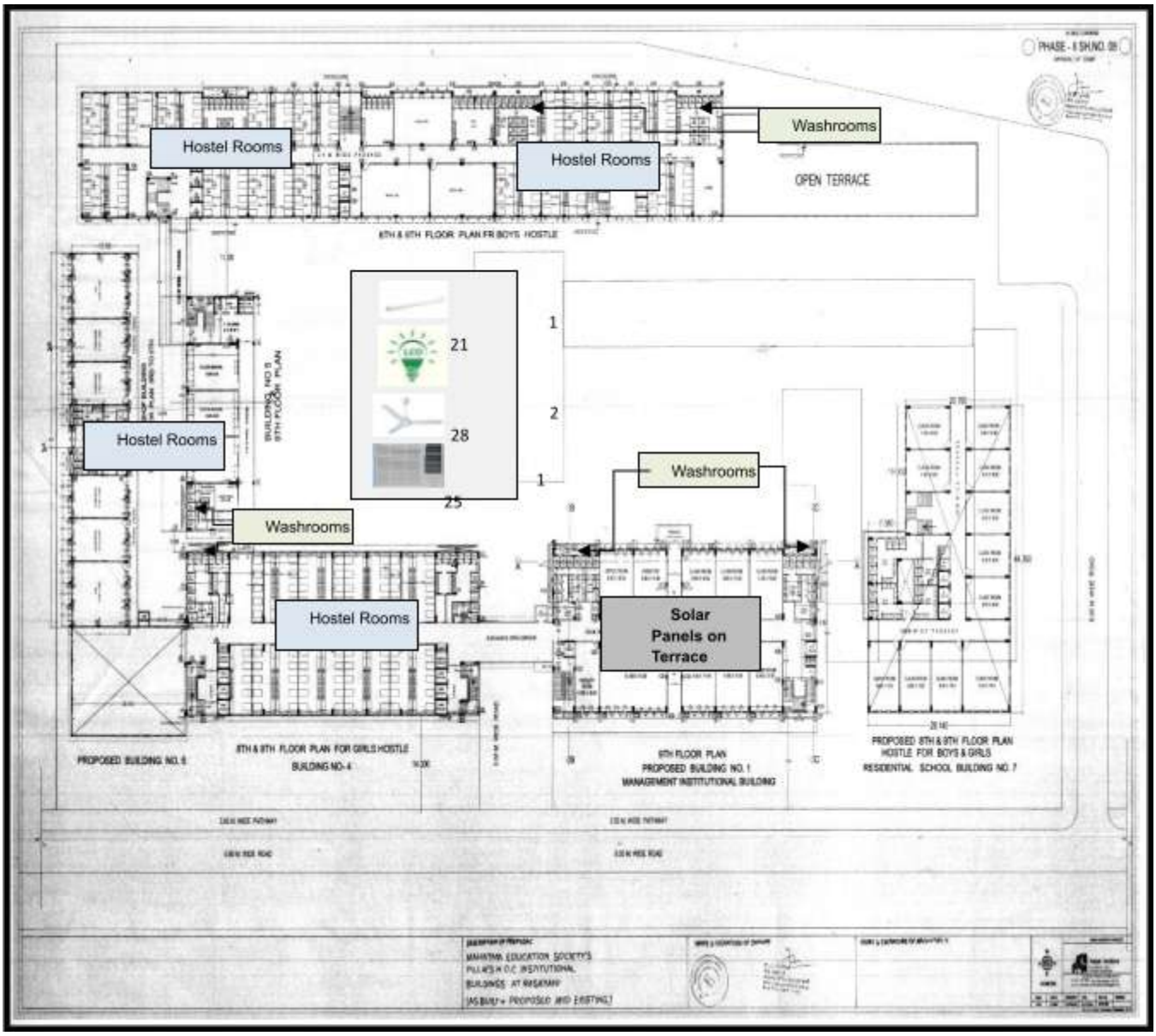
Seventh Floor



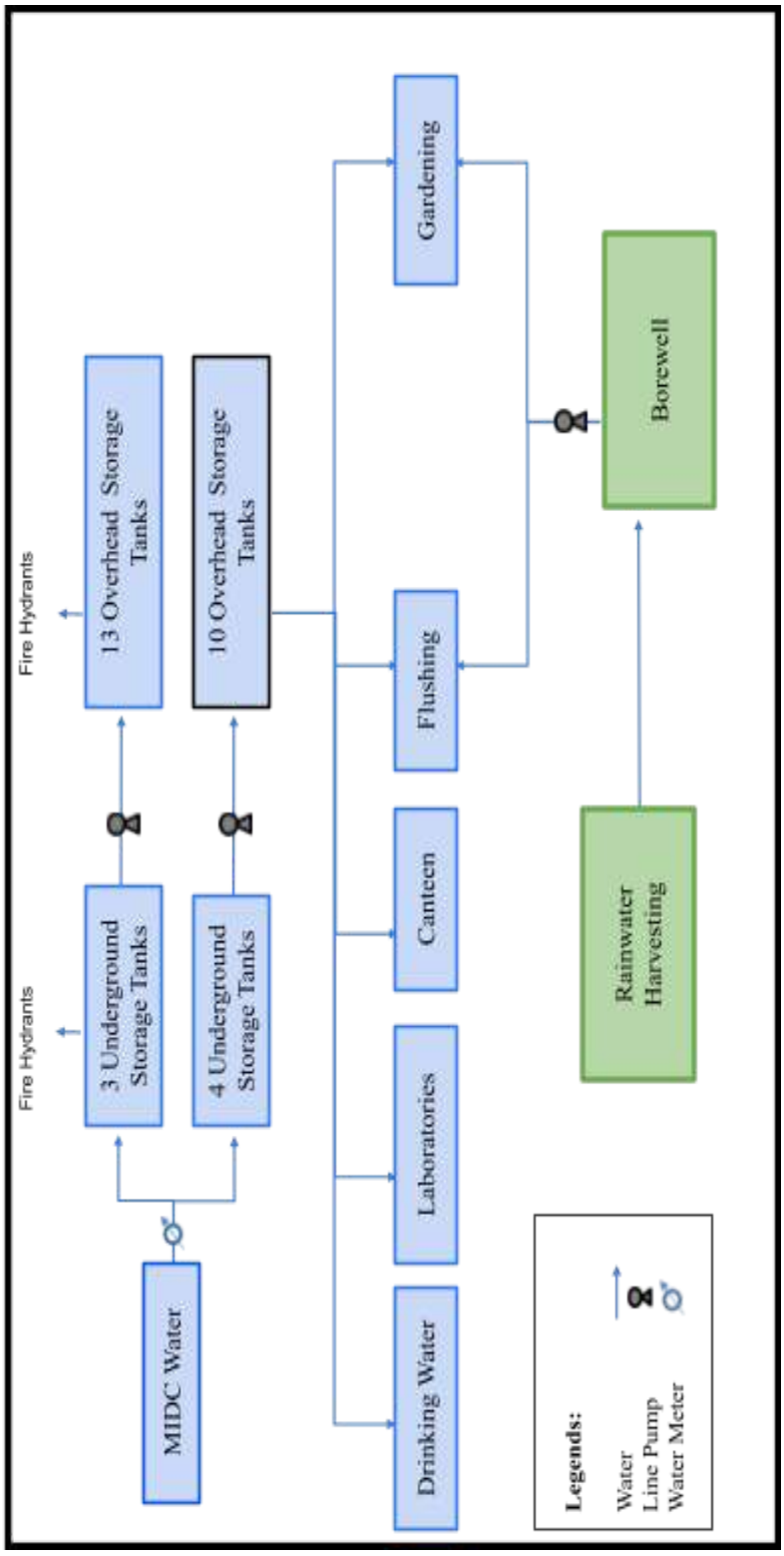
Eighth Floor



Ninth Floor


Hostel Rooms
Hostel Rooms
Washrooms
OPEN TERRACE
8TH & 9TH FLOOR PLAN FR BOYS HOSTLE
21
28
25
1
2
1
Hostel Rooms
Washrooms
Washrooms
Hostel Rooms
Solar Panels on Terrace
PROPOSED BUILDING NO. 6
8TH & 9TH FLOOR PLAN FOR GIRLS HOSTLE BUILDING NO- 4
9TH FLOOR PLAN PROPOSED BUILDING NO. 1 MANAGEMENT INSTITUTIONAL BUILDING
PROPOSED 8TH & 9TH FLOOR PLAN HOSTLE FOR BOYS & GIRLS RESIDENTIAL SCHOOL BUILDING NO. 7

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 elegan	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, 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	1 2	850	20
7	PHCET Library	1	6	2
8	AV Room	2 5	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
15	Staff Room	8	15	5
16	PHCACS Office	1	1	1
17	PHCACS Exam Cell	1	1	1
18	PHCACS Faculty	2	8	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	x
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	✔

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	x

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	✔

7. Checklist for Green Management

Sr. No.	Green program	Availability
1	Availability of e-books/ magazines and online resource	x
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 HOC 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.

Mahatma Education Society's,
Pillai HOCL Educational Campus,
Rasayani

Green Audit Report

PREPARED BY:

STEP PRIVATE LIMITED

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Green Audit Report of Mahatma Education Society's, Pillai HOCL Educational Campus, Rasayani, has been prepared by STEP based on visit to the Campus, checking records and interactions with faculty, non-teaching staff and students. No intrusive study was conducted during the audit.

Preliminary reconnaissance audit of the Campus was performed on **May 30, 2019** and detailed audit was conducted on **June 15, 2019.**

The green audit report presents green initiatives followed and taken up by the institution, and provides suggestions and recommendations to improve environmental sustainability.

Ms. Jyoti Palekar Managing Director STEP Pvt. Ltd.	Ms. Ankita Parab Sustainability Engineer STEP Pvt. Ltd.	Mr. Tejinder Jethra Environmental Engineer STEP Pvt. Ltd.	Dr. Sudhan Rajput Consultant STEP Pvt. Ltd.

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1. Introduction:

Mahatma Education Society's, Pillai HOCL Educational Campus, Rasayani (Campus) was established in the year 2008. It is one of the six Campuses of Mahatma Education Society, a non-profit organization managing 48 educational institutions. 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 Polytechnic (PHP) (2009), and Pillai HOC College of Education and Research (PHCER) (2010).

The Campus has 5737 students enrolled and 281 teaching faculty and staff members on its payroll. The Colleges offer various courses listed below:

Pillai HOC College of Architecture (PHCA)

- Bachelor of Architecture (B.Arch.)

Pillai HOC College of Engineering and Technology (PHCET)

- Bachelor of Automobile Engineering
- Bachelor of Civil Engineering
- Bachelor of Computer Engineering
- Bachelor of Electrical Engineering
- Bachelor of Electronics and Telecommunication 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)

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 (B.M.M.)
- 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.)
- Master of Commerce in Accountancy (M.Com.)
- Master of Science in Information Technology (M.Sc. I.T.)

Pillai HOC Polytechnic (PHP)

- Diploma in Civil Engineering
- Diploma in Computer Engineering
- Diploma in Electronics and Telecommunication Engineering
- Diploma in Mechanical Engineering

Pillai HOC College of Education and Research

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

Prior to the green audit (audit), questionnaire and checklist were prepared. During the audit STEP team visited entire Campus area i.e. classrooms, laboratories, library, washrooms, staff rooms, administration department, computer laboratories, placement cell, canteen, etc.

Campus Information

The Campus has interconnected buildings. For ease of auditing, the Campus was audited floor wise and the data has been collected. Campus building has 9 floors. The floor wise layout is presented in **Annexure 1**.

Floor wise Facilities of Campus	
Floor	**Facilities**
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	Conclave I, Principal's Cabin, IQAC 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	Conclave II, Counseling Room, 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 Room, 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

During Audit, STEP team interacted with following stakeholders:

Name	**Department**
Dr. Lata Menon	Dy. CEO and Principal PHCASC
Dr. Madhumita Chatterjee	Principal, PHCET
Dr. Chelpa Lingam	Former Principal, PHCET
Dr. Jagannath Nalawade	Head of Department, Information Technology
Ms. Divya Chirayil	Head of Department, Electronics and Telecommunication
Mr. Pragnesh Shah	Professor, Electronics and Telecommunication and Liaison Officer
Mr. Sunil Nair	Canteen In-charge
Ms. Monisha Mohan	Assistant Professor, Information Technology
Ms. Arya Pillai	Lecturer, Civil Engineering
Ms. Neha Rane	Examination In-charge, Examination Department
Mr. Rakesh Murali	Maintenance and Hardware
Mr. Rakesh Patil	Fire Office Maintenance
Mr. Chandrashekhar Nair	Lab Assistant, Basic Electronics Lab
Mr. Yogesh Maho	Lab Assistant, Civil Engineering Lab
Mr. Kalpesh Palekar	Lab Assistant, Machine Shop
Ms. Navneet Sandhu	Librarian
Mr. Sagar Pundalik	Librarian
Mr. Vaibhav Kanoje	Student
Mr. Pritesh Dhawale	Student
Mr. Jeffery Albert	Student
Mr. Siddhesh Mane	Student
Mr. Smit Pandya	Student

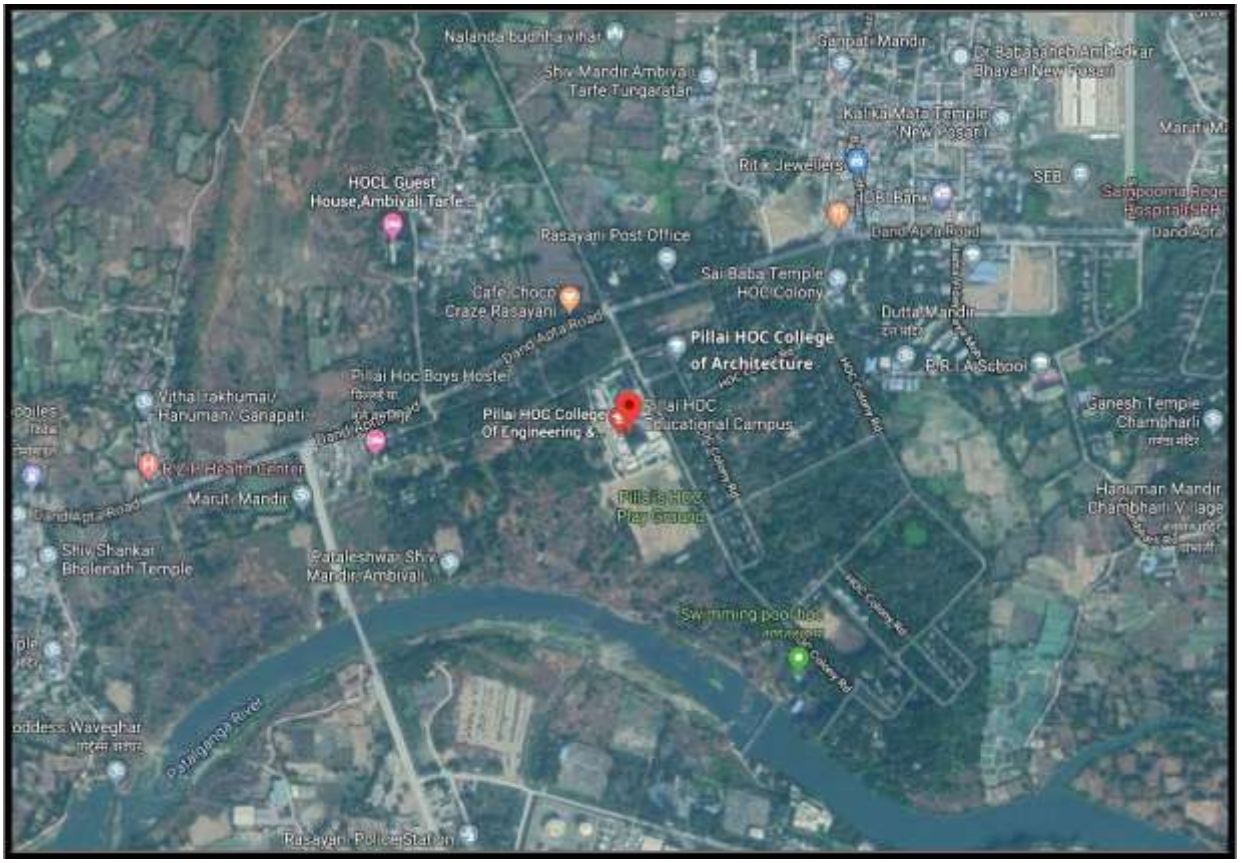
Further, STEP team interacted with following stakeholders over telephone:

Name	**Department**
Dr. Pradeep Chatterjee	Director, PHIMSR
Ar. Suchita Sayyaji	Principal, PHCOA
Prof. Amar Mange	Principal, PHP
Dr. T. A. James	Principal, PHCER

2. Environmental Setting:

Campus is situated at the entry of Hindustan Organics Chemical (HOC) Colony. Campus is spread across 14.2 acres (57465.36 sq. m.) It is at a distance of 4.5 km from Rasayani station, which is the nearest railway station, and about 16.5 km from Panvel railway station. The surroundings of Campus have a green belt, HOC hospital & HOC colony. Patalganga River is situated at the back of Campus about 150 m away.

Pillai HOCL Educational Campus, Rasayani



Location of Pillai HOCL Educational Campus, Rasayani

3. Green Audit:

For Green Audit following 13 major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified/ validated.

a) Good Daylight Design
b) Water Efficiency
c) Wastewater Management
d) Indoor Air Quality and Ventilation
e) Energy Efficiency
f) On-site Energy Generation
g) Temperature and Acoustic Control
h) Paper Waste Management
i) E-Waste Management
j) Canteen and Solid Waste Management
k) Universal Access and Efficient Operation and Maintenance of Building
l) Green Belt
m) Green Programs (Green initiatives)

STEP team reviewed each of these aspects across the Campus. Based on the review, we are providing our observations for each aspect.

Good Daylight Design
Observations:

a) Corridors are wide with good ceiling height. All the corridors receive good daylight. Classrooms, Labs and Library have high ceiling with wide doors and large windows. Windows are kept open to get adequate daylight.
b) Classroom walls, corridors and labs are painted with plastic emulsion paint, this enhances the daylight received.
c) Curtains are provided on some of the windows to avoid glare.
d) Chemical Laboratory is provided with flame-proof exhaust fans to disperse heat, fumes and odor. Flame- proof exhausts were seen in the canteen kitchen.
e) Staircases are designed in such a way that diffused sunlight enters but blocks the heat.

Good ceiling height and exhausts in Chemical Laboratory

Daylight in Library

Staircase receive good daylight

Good daylight and Ventilation in classrooms

Water Efficiency:

Observations

4 Campus uses water from bore wells and that supplied by Maharashtra Industrial Development Corporation (MIDC) to meet its general needs. MIDC Charges ₹20 for 1000 L of water. The water consumption of March and April 2019 is graphically represented in **Figure 1**. Average water consumption for March and 2019 is 3739 KL/ month (125 KL/day). This works out to be 21L/person/day, which is very normal and comparable to standards (http://dasta.in/wp-content/uploads/2015/04/CB_Code_2002.pdf).

5

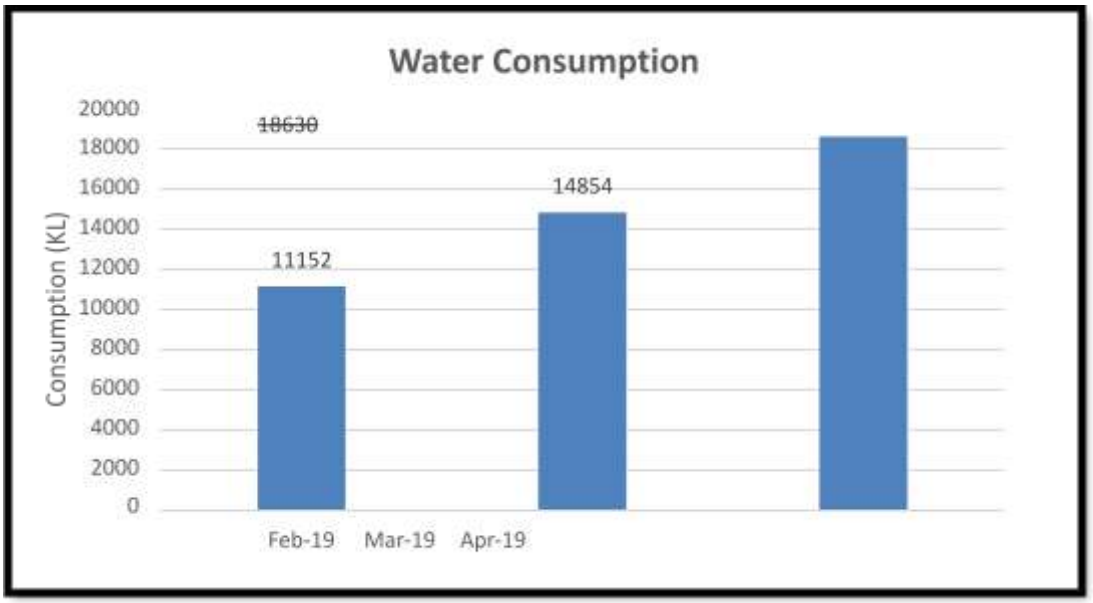


Figure 1 Water Consumption- Campus

a) Water received from MIDC is stored in underground and overhead storage tanks.

Water Storage Tanks Location	Quantity	Total Capacity
Underground	11	810 KL
Overhead	33	1050 KL
Total capacity	44	1860 KL

b) From underground storage tanks water is pumped to the overhead tanks located on building terrace, from where it is distributed to washroom basins, laboratories, and for drinking after purification. The water distribution diagram is presented in **Annexure 2**. Daily water usage is around 125 KL (as per water bills).

c) 'Rainwater harvesting system' is installed in the Campus. Rainwater from roofs/ terrace is collected through a well-designed network of pipes in underground tanks. The pipes carry water into specially constructed recharge pits to recharge aquifers and tube well. Water from tube well and water collected from rainwater harvesting system (during rainy season) is used for gardening, flushing in toilets; and for fire water makeup.

d) Average rainfall in Rasayani is 3267 mm per annum. Based on this, rainwater harvested by the Campus was calculated as 18, 662 cubic m. approximately. Part of harvested water is stored in underground storage tanks and rest is used to recharge aquifers & tube well.

e) Water coolers & purifiers are installed at drinking water supply points.

f) Normally mops are used for floor cleaning. Floors are mopped once in a day.

g) Few washrooms have water saver faucets. Installation of water saver faucets in all toilets can save water and will help in minimizing the water footprint of the Campus.

h) Dual flushing system is not provided in the washrooms. Water saving due to dual flushing system can be upto 30%.

i) If water leakage is observed, in-house maintenance team immediately attends to leakage. Records of such leakage complaints can be maintained to quantify water saved.

j) No Signage is provided in washrooms emphasizing water conservation.

Rainwater Harvesting System- Recharge Pit

Signage near Water purifier/ cooler

Wastewater Management:

Observations:

Wastewater is mainly generated from toilet flushing and canteen. There are total 146 washrooms in Campus.

a) Sanitary wastewater generated from washrooms and wastewater from canteen and Laboratories is connected to sewerage system provided by MIDC.
b) Wastewater/ sewage recycle is not practiced in Campus as grey water/ sewage treatment /recycle facility is not provided.
c) Campus has proposed to install sewage treatment plant.

Indoor Air Quality & Ventilation:

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutants are listed as below:

- Molds and other allergens – This may arise from water seeping into the building envelope or skin, plumbing leaks, condensation due to improper ventilation, or from ground moisture penetrating a building part.
- Volatile Organic Compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities

Observations:

a) In the classrooms the mode of ventilation is natural draft through windows. Fans are provided to improve air circulation. A few rooms/ labs e.g. offices, computer labs, computer server room are air conditioned.
b) Heating Ventilation and Air Conditioning (HVAC) system are present only for auditoriums.
c) Smoke detectors were not seen but fire alarms were present on each floor.
d) Exhaust fans are provided only in Chemistry Laboratory.
e) Very few indoor plants were seen in Campus. Some artificial plants were seen in buildings, these can be replaced by indoor plant. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer **Annexure 3** for details.
f) Green belt has been set up in Campus area.

Energy Efficiency:

Electricity:

The major energy consumed is through electricity usage. The Campus has one common electricity meter. Electricity is provided by Maharashtra State Electricity Distribution Co. Ltd. The monthly average electricity consumption from March 2018 to May 2019 is around 52,270 KWh (Units). Electricity consumption of the Campus is graphically represented in **Figure 2.**

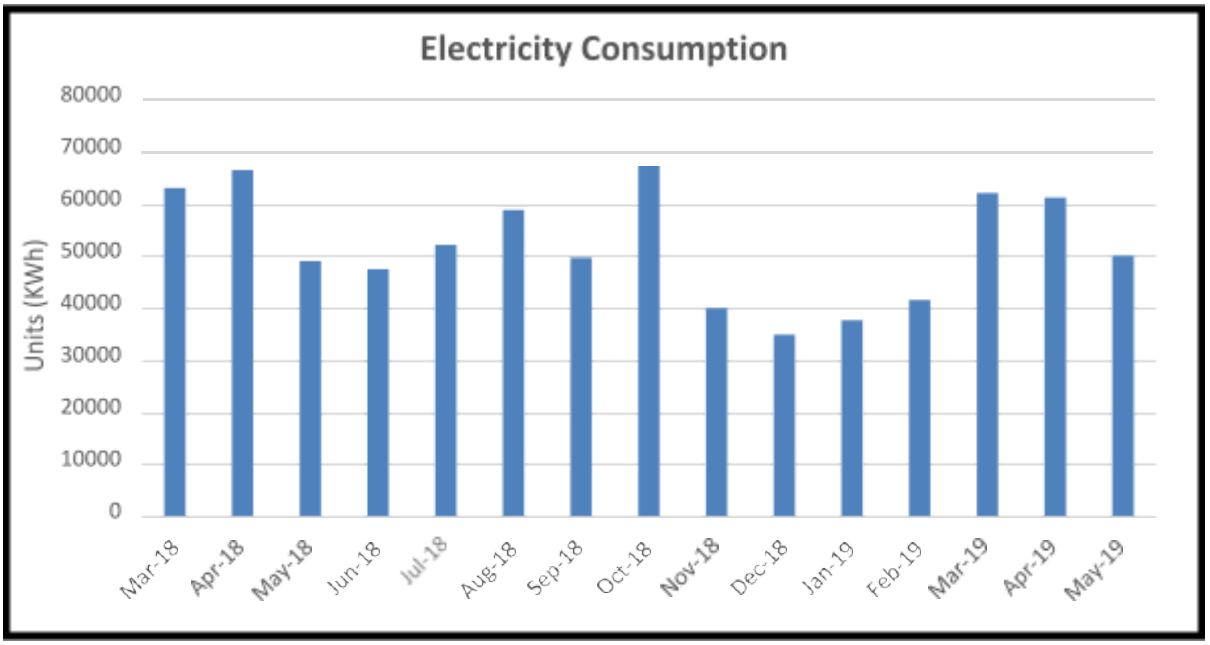


Figure 2 Electricity Consumption- Campus

The above graph indicates that the maximum energy consumption is in the month of October 2018 followed by March 2018 and the minimum energy consumption is in December 2018. This may be due the colleges having holidays in December-January each year. A slight decrease in energy consumption is observed (3%) from 2018 to 2019 due to increased use of energy saving devices like LED bulbs and tubes instead of conventional CFLs and tube lights. Due to replacement of tube lights/ CFLs with LEDs, Campus has saved Rs. 14385.00.

The areas of major electricity consumption of electricity are:

Areas of consumption	Quantities
Tube lights & CFL	3878
Light Emitting Diode (LED)	2137
Fans	2171
Air Conditioners	122
Computers	1148
Printers	102
Projectors	45
Refrigerators & Deep freezers	4
1 Phase machines	21
3 phase Machines in labs	54
CCTV	202
Television	6

The list of electrical appliances and possible energy intensive areas in the Campus is provided in **Annexure 4**.

Observations:

a) Conventional tube lights, LEDs & fans are installed in classrooms and labs.
b) Campus has carried out energy audit in June 2019 and energy audit report is not yet received. Campus should comply by the recommendations given therein.
c) Around 34% lights present in Campus are LED. LED lights save energy up to 75% and also, they are 25 times durable than incandescent lights. Campus is in the process of replacing periodically the dysfunctional conventional tube lights with LED lights.
d) Campus has few air conditioners with one-star and three-star ratings- standards set by Bureau of Energy Efficiency (BEE). Around 10 old air conditioners present are without any ratings.
e) Refrigerators are installed in canteen and laboratories. They are without any ratings.
f) Uninterrupted Power Supply (UPS) system is provided in some computer laboratory. UPS system is typically used to protect computers, data centres, telecom equipment or other electrical equipment where an unexpected power disruption could affect the work or lead to data loss.
g) Tube lights do not have reflectors. Reflectors can reduce electricity consumption.
h) All the computers have LED screens; Computers are shut down when not in use. Signage for the same was also put up on the wall.
i) Separate switches are provided for tube-lights and fans in all classrooms. So, it is possible to switch on/ off a specific light or a fan and to avoid wastage of energy due to common area illumination.
j) Signage is present near some electrical switch boards to encourage users to switch off light and fans to save electricity.

Air Conditioner with 3 star rating

Signage above switch board

On-Site Energy Generation (usage of LPG/ Natural Gas):
Observations:

a) LPG cylinders are used in the canteen for cooking. On an average 3 cylinders of 19 kg are required per day. 1 cylinder of 19 kg will generate 881.6 MJ (Mega Joules) of energy; hence total energy generation will be 2644.8 MJ.
b) The LPG cylinders were stored horizontally. Cylinders must be prevented from falling, movement or physical damage by storing them in approved cages/racks, securing the cylinders with safety chains or using other approved retention methods for LPG gas cylinder safety.

(http://peso.gov.in/Work_Mannual/Gas_cylinder_Rule_WM.pdf)

c) Campus has 2 Diesel Generators of 250 KVA for backup in case of power failure. These are sufficient as the power demand of the Campus was 480 KVA from April 2018 to Mar 2019.

d) Campus has installed solar panels of capacity 10 KWP (Kilowatt Peak for solar is the rate at which energy is generated at peak performance) by 'JYOTITECH Solar LLP' to promote use of renewable energy. This energy is used for street lights within the Campus.

Diesel Generators

Roof-top Solar Panels

Temperature and Acoustic Control Observations:

a) Campus is located inside the HOC Colony. There is no noise pollution as there are few vehicles on the road.

b) Acoustic control walls are provided in auditorium and Conclaves.

c) Trees are planted in the Campus which may help in reducing temperature and abating noise pollution.

d) Maintenance free tiles are used all over the exterior walls of buildings which eliminate the cost of painting and makes the building leakage free. These tiles reflect sun rays thus help in keeping the inside temperature cool.

Green belt in Campus

Maintenance free tiles for building

Paper Waste Management:

Being an academic institution, waste paper is the main solid waste generated in the premises. Campus has taken steps to minimize and avoid paper usage.

Observations:

a) Prints and photocopies are taken on both sides of the paper to avoid excess paper usage. Digitalization (scanning) is also practiced.
b) All libraries have books, newspaper, journals and magazines available for staff and students. They also have E-book system where books and journals are available online. More than 7000 books are available online.
c) Internal communications are through E-mail/SMS.
d) Notices are displayed on the notice boards as well as are made available on the website. Campus has its portal where notices are sent & attendance is recorded.
e) The dissertation reports, journals and answer papers are stored as per the University rules. Most of the storage is in library and staff room. After 3-4 years, old submissions and answer papers are archived and stored in special storage areas on ground floor as per university rules.
f) Old papers are given to 'Jai Bhavani Company, L.P. Nerul' in exchange of new papers in certain ratio as decided by the management. Currently the ratio is 2:1 (old papers: new papers). The selection process is by bidding from different scrap dealers.

Library

Notice board outside Electronics Lab

E-Waste Management:

Observations:

a) Campus is digitalized to a large extent. This includes some classrooms, library, internal mails etc. Campus has E-library, AV classrooms, student & staff portal for academic work, biometric attendance system for staff, lecture recording system, etc.
b) Old electronic instruments are given to the dealer under buy-back policy. Old E-material is used to make components which are used by students for their projects. Campus has a 'Component Laboratory' for the same.

Solid Waste Management:

Observations:

a) Segregation of wet and dry waste was seen only in the canteen. No separate bins were seen for wet biodegradable and dry recyclable waste in rest of the Campus. There is no signage for minimizing food wastage or for promoting segregation of wet and dry waste.
b) Biodegradable waste is mainly generated in canteen. Around 25 kg dry waste and 22-25 kg wet waste is being generated by the canteen daily. Campus has recently installed composting unit where canteen waste is being treated daily.
c) In other areas like classrooms, mostly paper waste and plastic wrappers are generated. Dustbins are provided in classrooms, offices, cabins.
d) Dysfunctional/ broken benches are repaired and reused.

Composting unit

Composting unit - inside

Dustbin for waste collection

Signage for Garbage disposal

Universal Access and Efficient Operation and Maintenance of Building:

Observations:

a) Campus is easily accessible from the road. Staircase is provided for staff and students. Ramps are provided for physically handicapped people.
b) Campus has 13 elevators and 11 staircases for students and staff.
c) Staircases and classrooms have wide windows, which can allow safe evacuation during emergency.
d) Since the access and staircases are wide 2 meter and uncluttered, it is possible to have a safe evacuation by stairs during emergency.
e) Handrails are provided only on few staircases. Handrails are essential to avoid falling in emergency situations.
f) 'Shree Sadguru Krupa Fire Services Pvt. Ltd.' is a service provider for maintaining firefighting equipment. Fire extinguishers and fire hydrants are provided for emergency near staircase and one set near lift. Most of them are inspected and serviced by Shree Sadguru Krupa annually. Some fire extinguishers in Campus were past their servicing / expiry dates. They need to be serviced immediately.
g) There are 13 overhead and 3 underground water storage tanks for firefighting with total capacity of 575 KL.
h) There is no signage for emergency fire exit. This is important for evacuation during emergency.
i) Programs like "Fire Safety & Hazard Management Training' should be conducted annually for staff as well as for students.

Fire extinguisher

Fire alarm

Green Belt/ Landscaping:

Observations:

a) The Campus has an area of 57465.36 sq. m. Plantation helps maintaining lower temperatures of the area.
b) Potted plants are provided in Campus.
c) Very few Indoor plants were observed on ground floor.
d) Vertical Gardening is a possibility on the compound wall of Campus.

Green Initiatives:

Observations:

a) Campus has a 'Nature Club' which organizes different green programs throughout the year.
b) 'Know green and think green' is promoted on Campus by NSS and Nature Club in the institution
c) Campus has installed solar panels of capacity 10 KWP to promote use of renewable energy. This energy is used for street lights within the Campus.
d) Campus has started an initiative under E- waste management. E-waste collection cell has demonstrated the utilization of E-waste to make E-waste concrete.
e) Campus has one rainwater harvesting system. Rainwater harvested by the Campus was calculated as 18, 662 cubic m. approximately.
f) Gardens are watered using drip/ sprinkler irrigation system to save water.
g) Campus had started 'Zero Garbage Initiative' to awareness regarding solid waste management.
h) Canteen solid waste is separated into dry and wet waste. Awareness program has been carried out for canteen workers for waste segregation. 2 bins for dry and wet waste are present in the canteen.
i) "My Green Bin", 2 composting units are installed to compost canteen waste.
j) National Conference on 'Environmental, Economic and Political Aspects of Climate Change' was held on September 8, 2017.
k) Environment Management is included in curriculum for extension and awareness.

E-Waste Management

Mr. Rahim Sheikh is guiding students at the Park

Explaining Composting procedure

Nature Club Activity

4 RECOMMENDATIONS/ SUGGESTIONS:

4.1 For Improving Energy Consumption:

a) Every classroom and lab where central switch board is provided should have a diagram linking place of tube light, fan, etc. with the corresponding switch. This will ensure that correct fitting is switched on/ off, which can save time & unnecessary operation.
b) Conduct energy audit every two or three years and determine the lux levels within Campus, based on which reduction in number of light fittings in the Campus could be considered.
c) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing. Equipment with star rating, made using eco-friendly materials; with safe disposal policy to be preferred. Policy of returning equipment at the end of life span to the supplier may be preferred.
d) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
f) Computers should be switched off from main power connections.
g) Notices/ signage can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all electrical equipment when not in use.
h) Control sensors can help to reduce consumption by automatically dimming lights when people are not around, and keeping blinds open to use natural light & reduce energy consumption.
i) Raise awareness:
   - Encourage students to help in monitoring energy consumption & implement corrective actions
   - Integrate energy education into classroom learning.

4.2 Water Conservation:

j) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption.
k) Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
l) Notices and signage on water conservation could be displayed near washrooms and water coolers.
m) Dry sweep or use a sponge broom when possible, instead of using a hose to clean floors, sidewalks, or other hard surfaces.
n) Minimize/ reduce water usage by installing water saving faucets such as Pressmatic taps, tap aerators, jet sprays, etc.
o) Dual flushing system must be installed for toilet flushing which saves considerable amount of water.
p) Grey water/ sewage recycling system can be installed for flushing water in toilets. This will reduce the fresh water footprint.
q) Installation of waterless urinals should be considered to reduce water consumption.

4.3 Paper and other Solid Waste Reduction:

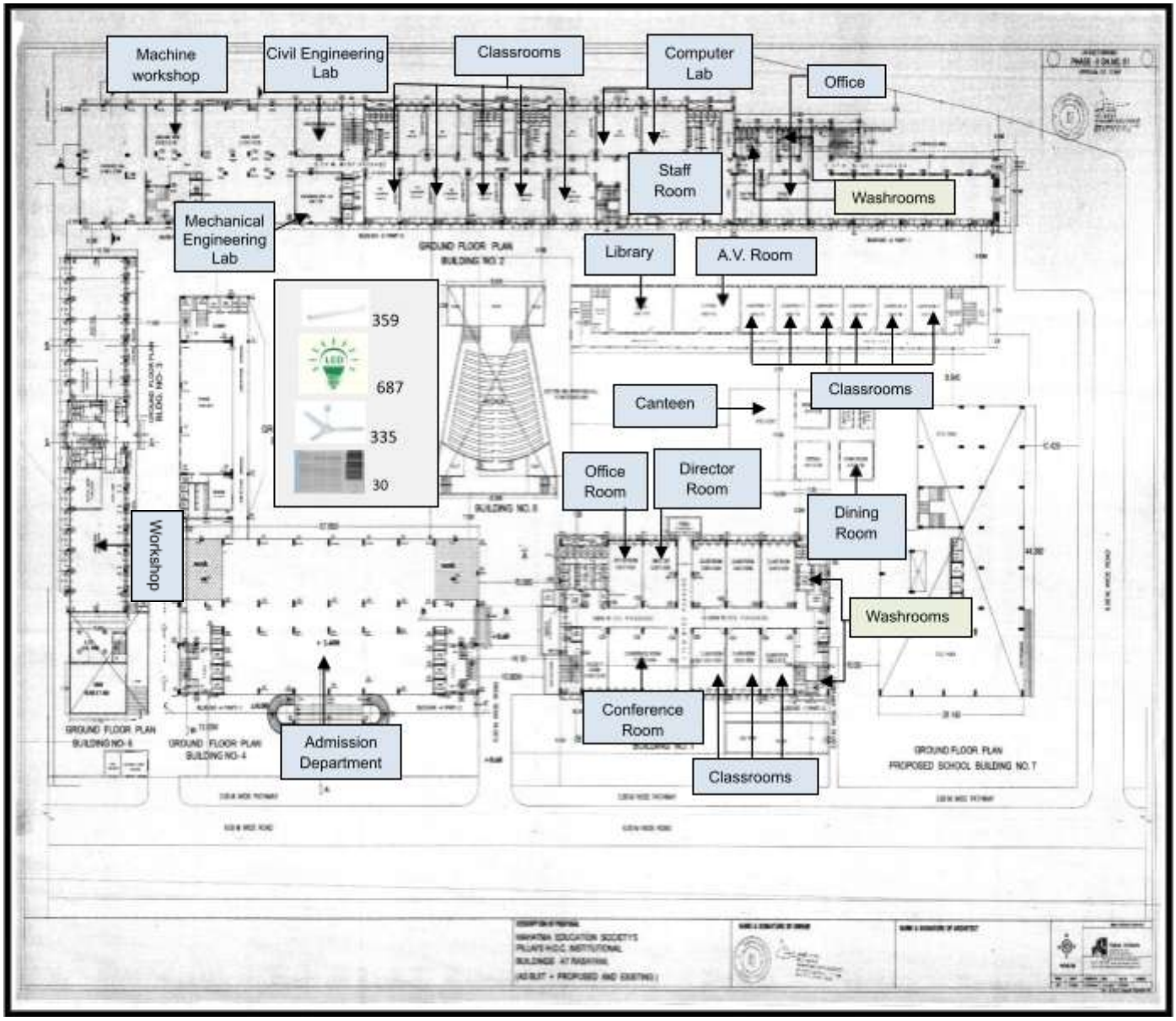
a) Inventories of all solid waste generated in the premises must be maintained to monitor the waste generation.
b) There should be waste segregation practices at each source (currently present only in canteen). Separate bins to be provided.
c) Enhance recycling- An Initiative under Green program could be started by creating a group where students can recycle books, personal clothes and other material to needy students.
d) Standard Operating Procedures (SOP) for Solid and E-waste management and for recycling of waste should be prepared and practiced. The SOP's may include collection, segregation and reuse of different types of wastes, if any (e.g. biodegradable waste for composting). This will help in safe disposal of waste to recycle agencies.
e) Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin.
f) Plastic bottles to be handed over to PET recyclers.
g) Campus can introduce online app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.
h) Paper usage shall be monitored to understand the impact of digitization in the facility.

4.4 Others:

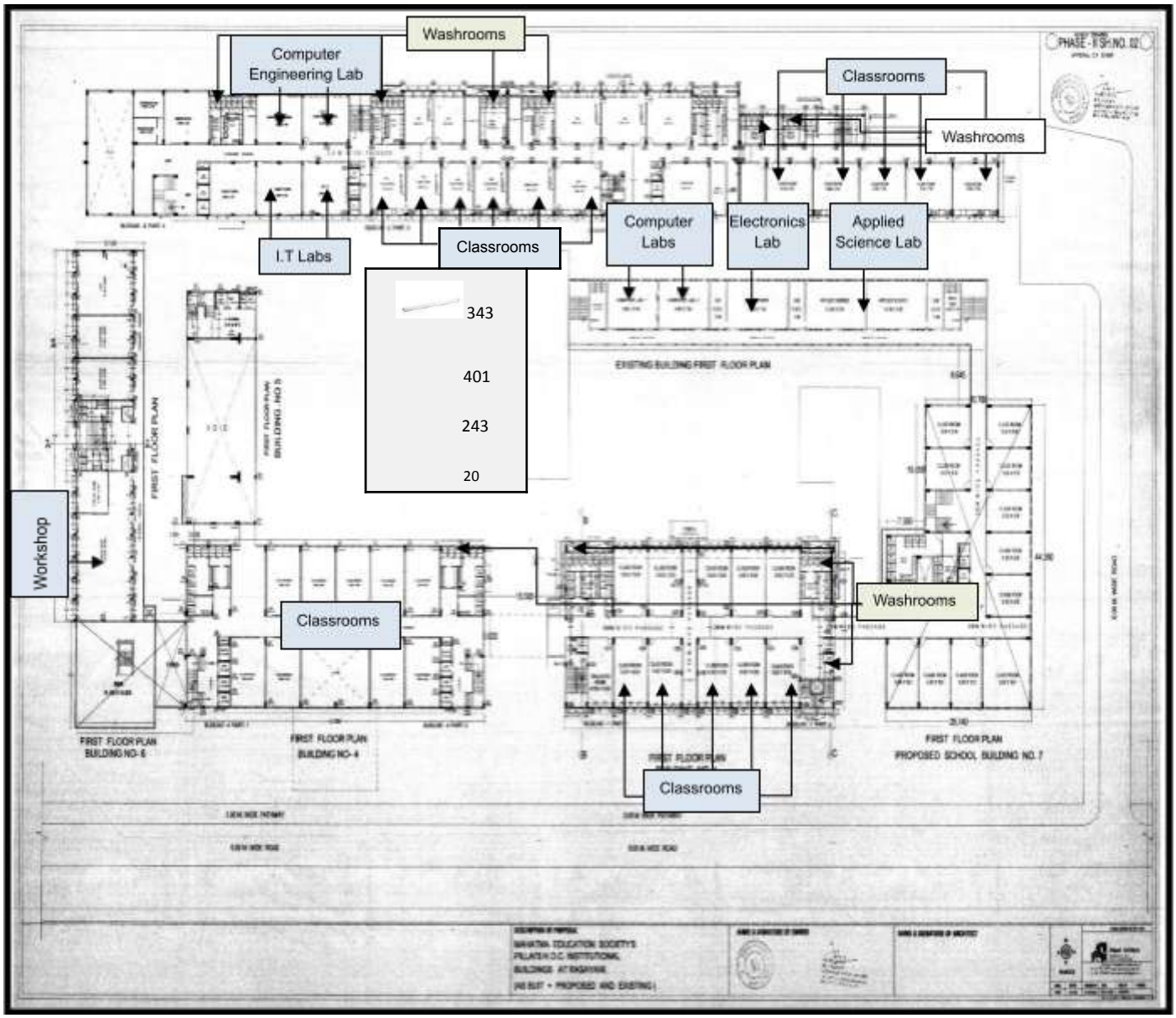
a) Consider setting up an environmental advisory committee with student's involvement. The discussions/ information sharing among different departments can generate ideas and awareness on green issues, which could be implemented.
b) Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes. Set annual targets for Green Initiatives & monitor them closely. Create 'Green Champions'.
c) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation, etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode. Or wallpapers informing students about environment conservation can be created.
d) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decisions.
e) Vertical gardening can be done using indoor plants. Hydroponic garden can be an option where in small space also plants can be planted. Drip irrigation system can be provided for plants.

ANNEXURE 1: Campus Floor Plan

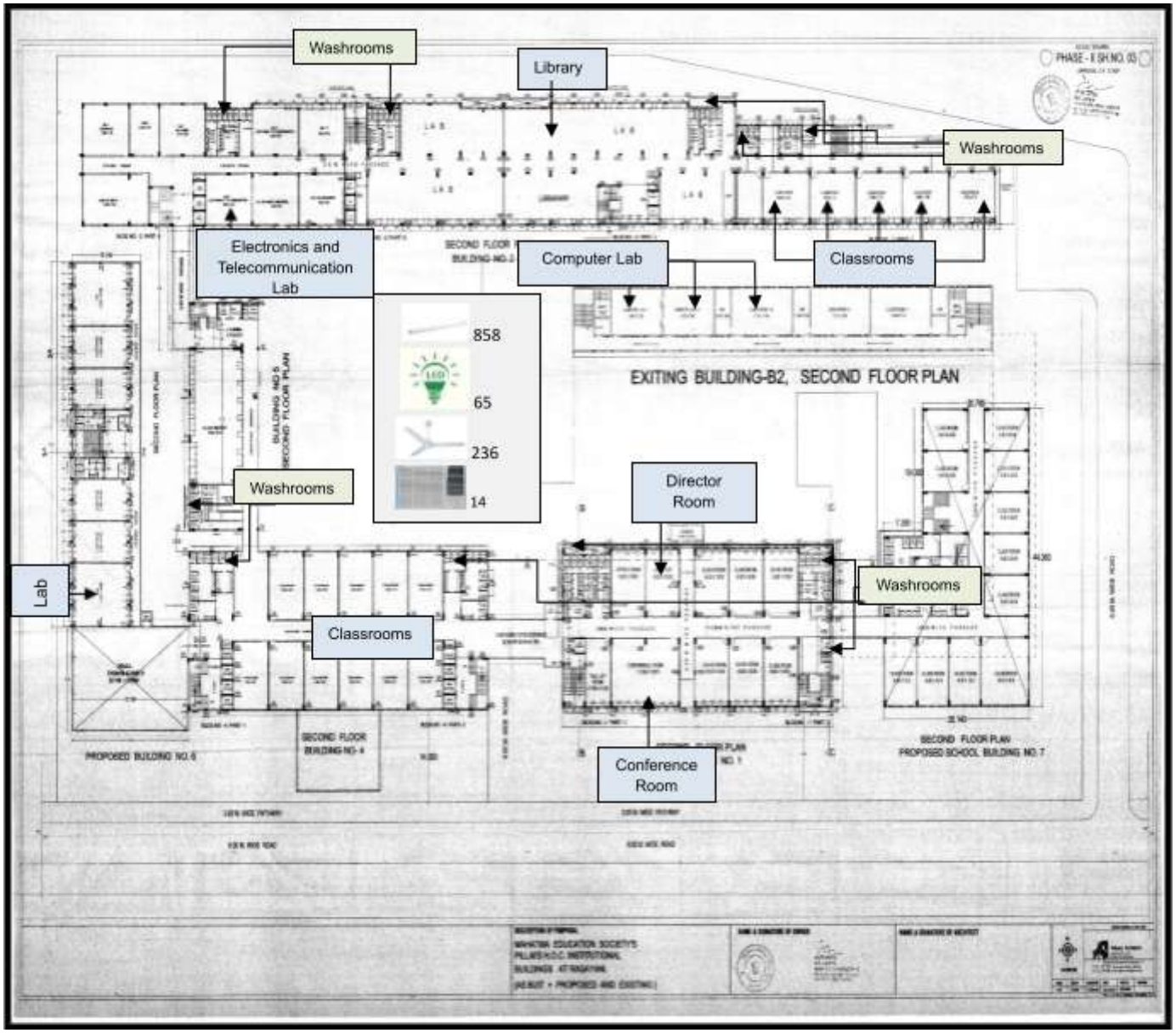
Ground Floor



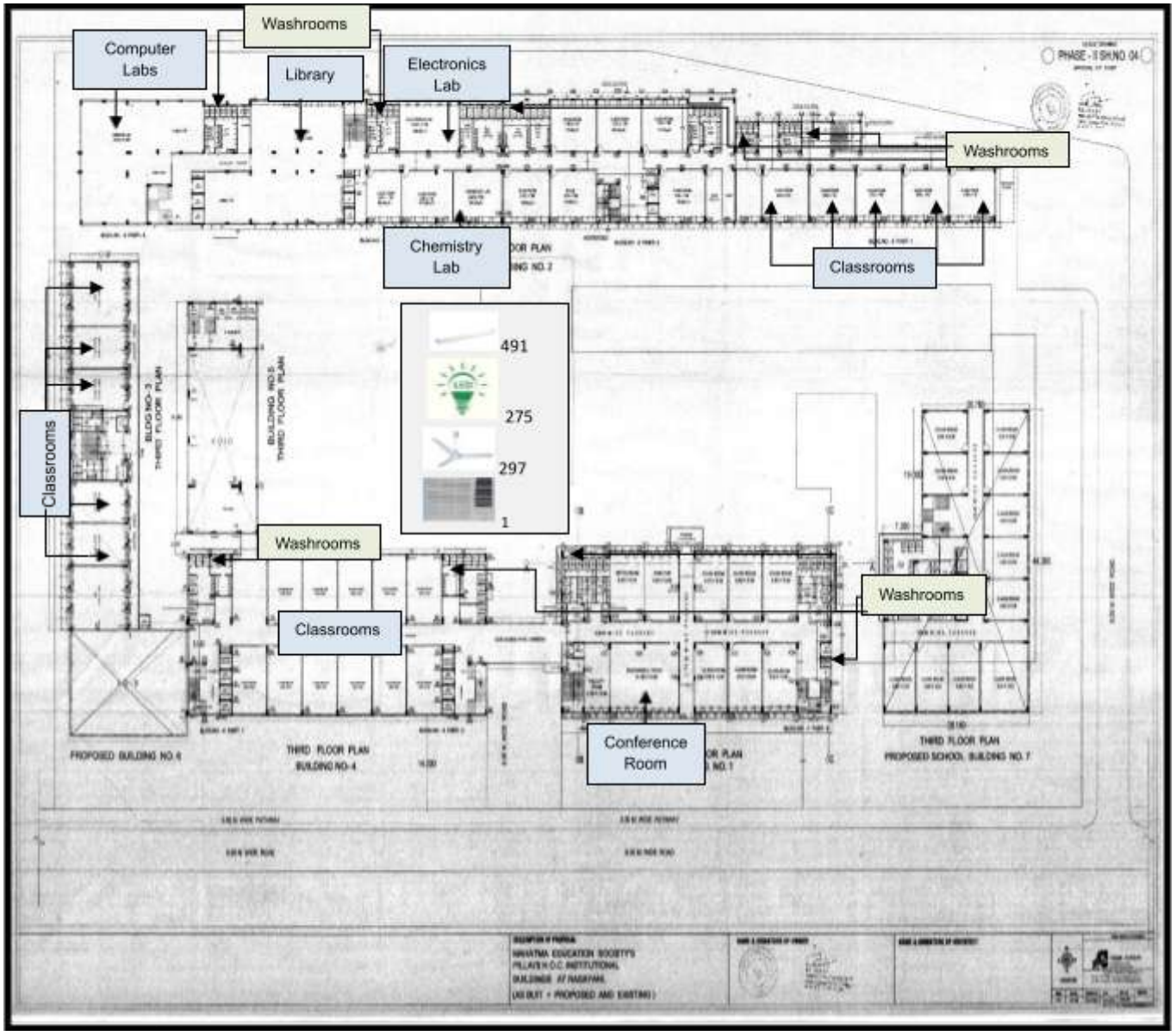
First Floor


Washrooms
Computer Engineering Lab
Classrooms
Washrooms
I.T Labs
Classrooms
Computer Labs
Electronics Lab
Applied Science Lab
343
401
243
20
Workshop
Classrooms
Washrooms
Classrooms
FIRST FLOOR PLAN BUILDING NO- 6
FIRST FLOOR PLAN BUILDING NO- 4
FIRST FLOOR PLAN PROPOSED SCHOOL BUILDING NO. 7

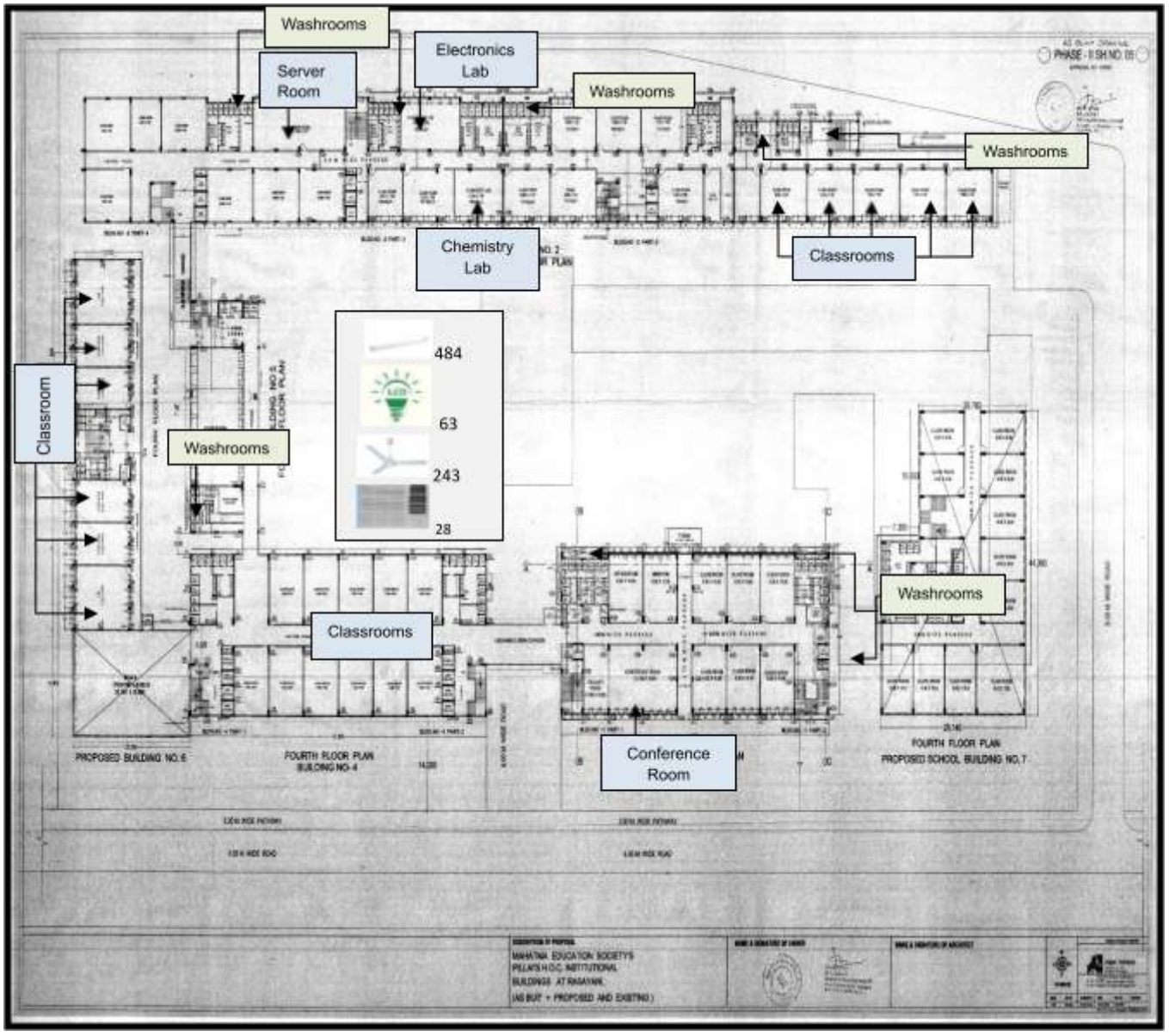
Second Floor



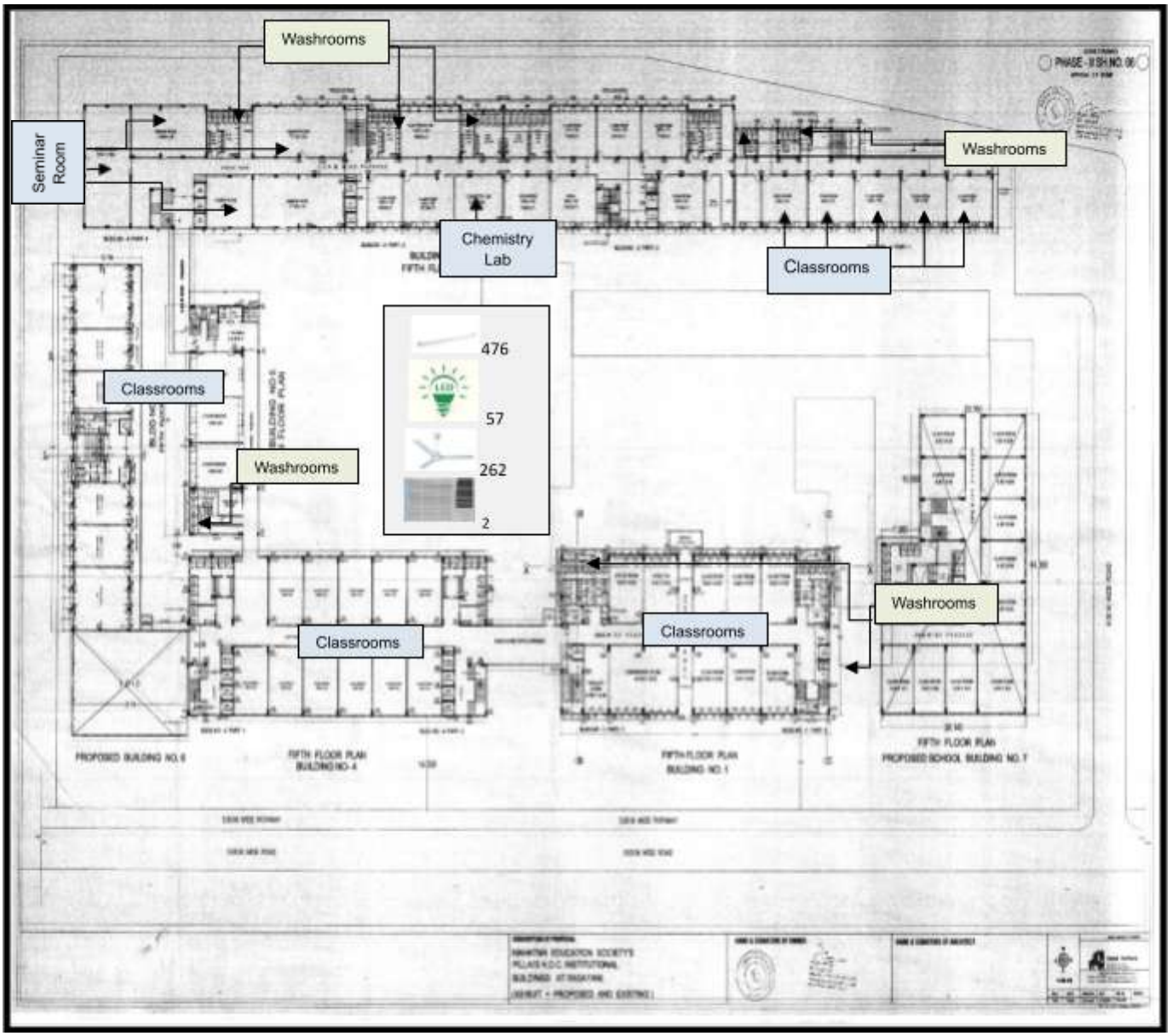
Third Floor


Washrooms
Computer Labs
Library
Electronics Lab
Washrooms
Chemistry Lab
Classrooms
491
275
297
1
Classrooms
Washrooms
Classrooms
Washrooms
Conference Room
PROPOSED BUILDING NO.6
THIRD FLOOR PLAN
BUILDING NO-4
THIRD FLOOR PLAN
PROPOSED SCHOOL BUILDING NO.7

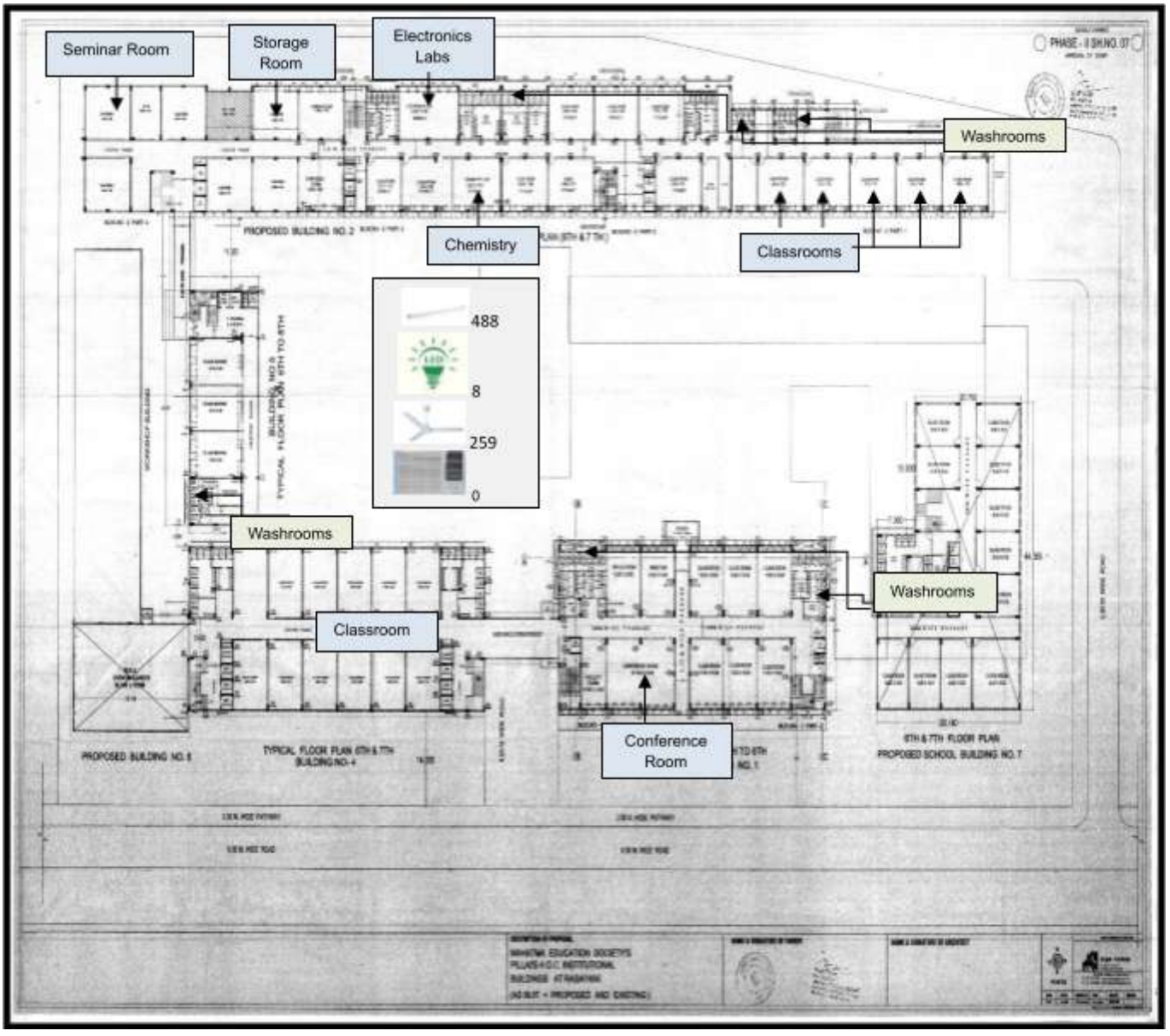
Fourth Floor



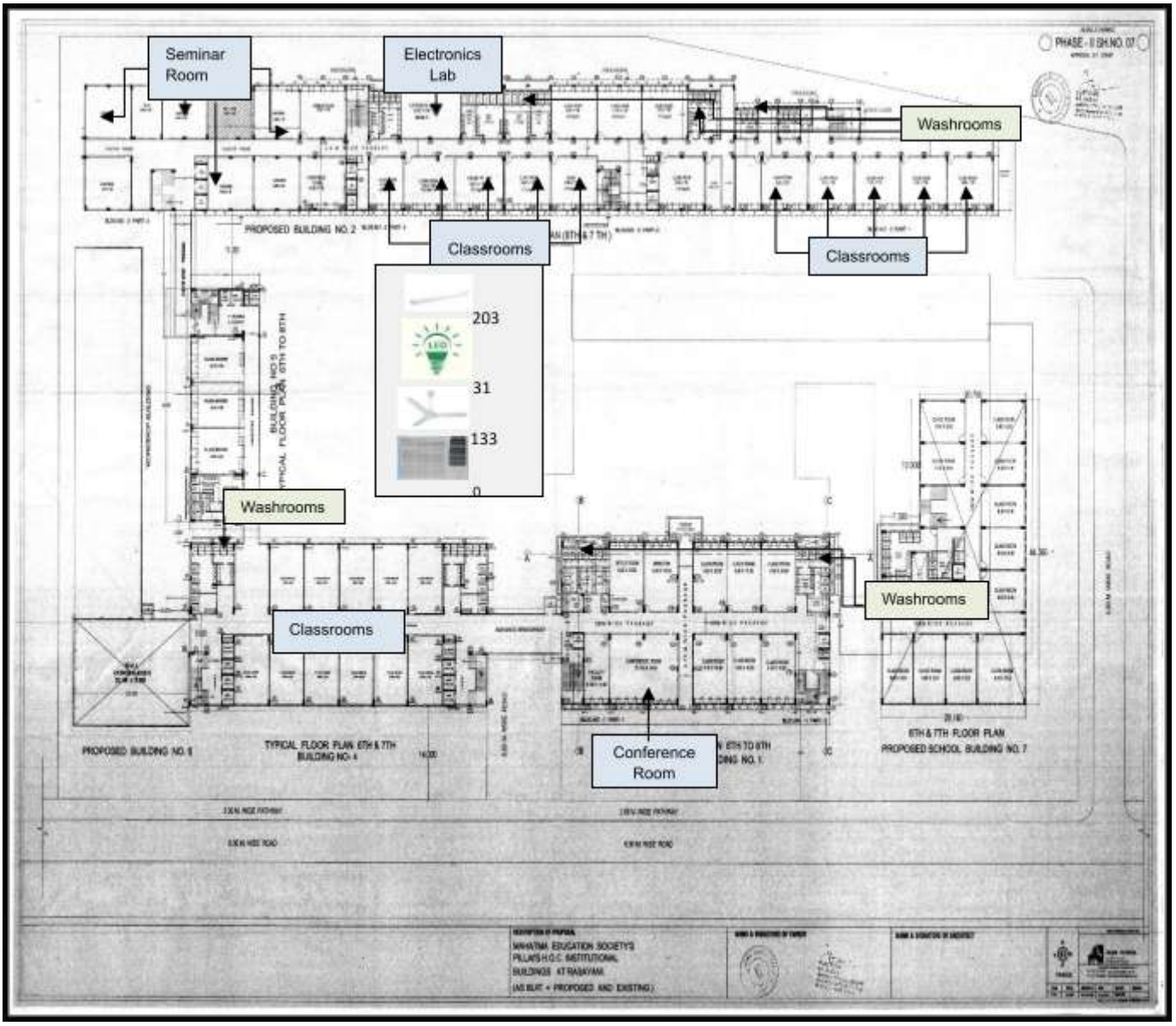
Fifth Floor


Washrooms
Seminar Room
Washrooms
Chemistry Lab
Classrooms
476
57
262
2
Classrooms
Washrooms
Classrooms
Classrooms
Washrooms
PROPOSED BUILDING NO. 6
FIFTH FLOOR PLAN BUILDING NO. 4
FIFTH FLOOR PLAN BUILDING NO. 1
FIFTH FLOOR PLAN PROPOSED SCHOOL BUILDING NO. 7

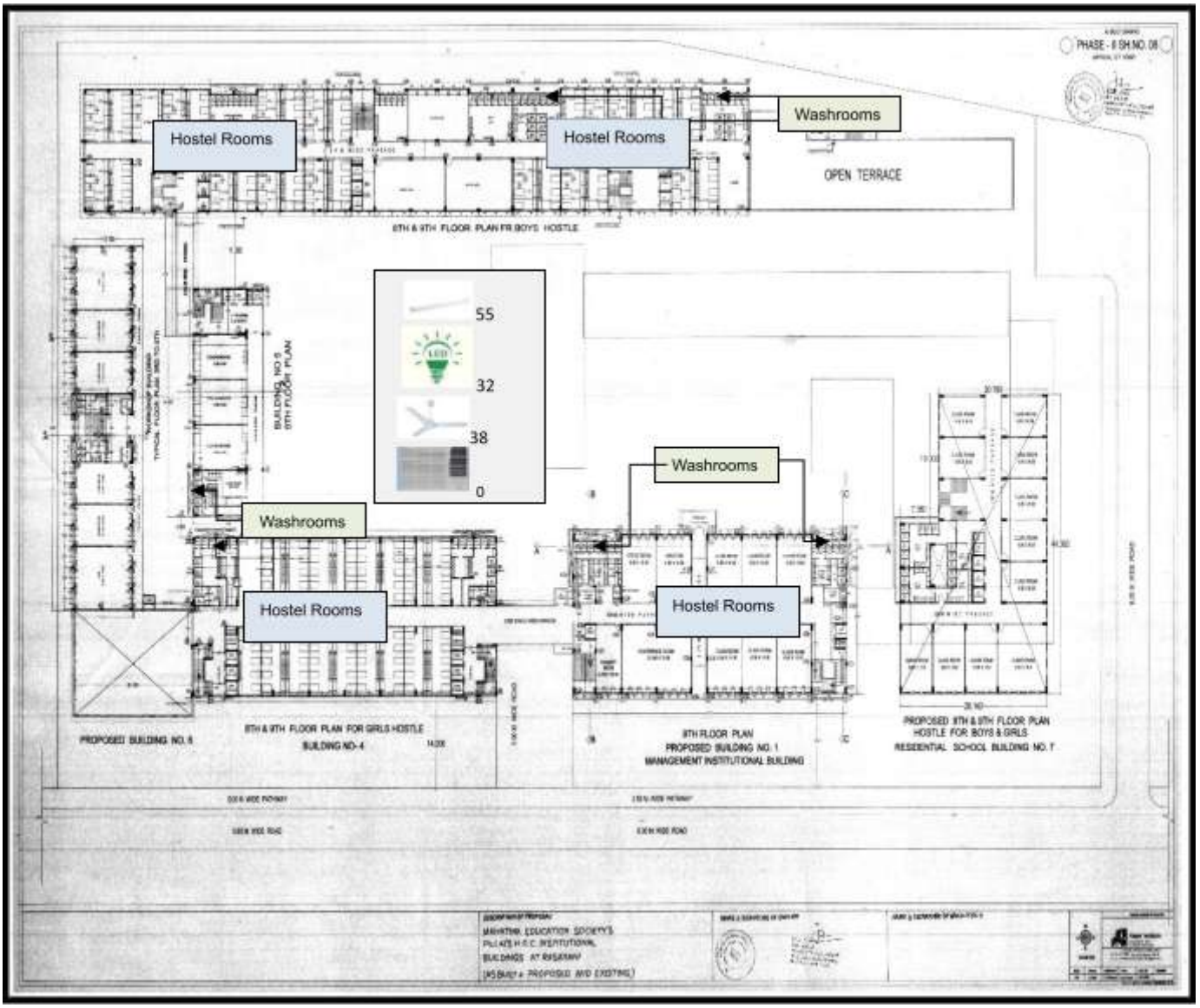
Sixth floor


Seminar Room
Storage Room
Electronics Labs
Washrooms
Chemistry
Classrooms
488
8
259
0
Washrooms
Classroom
Washrooms
Conference Room
PROPOSED BUILDING NO.8
TYPICAL FLOOR PLAN 6TH & 7TH BUILDING NO-4
6TH & 7TH FLOOR PLAN PROPOSED SCHOOL BUILDING NO.7

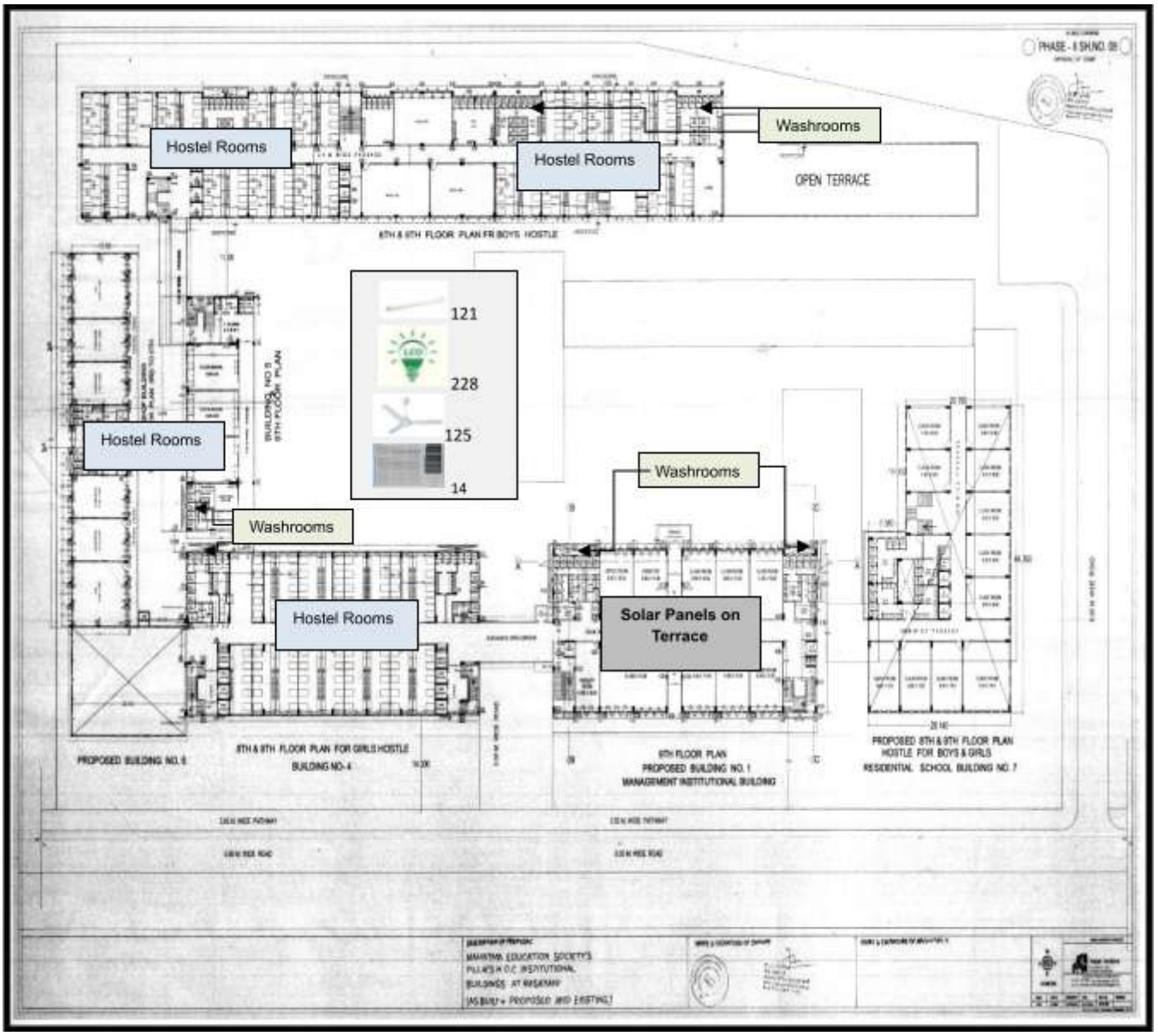
Seventh floor



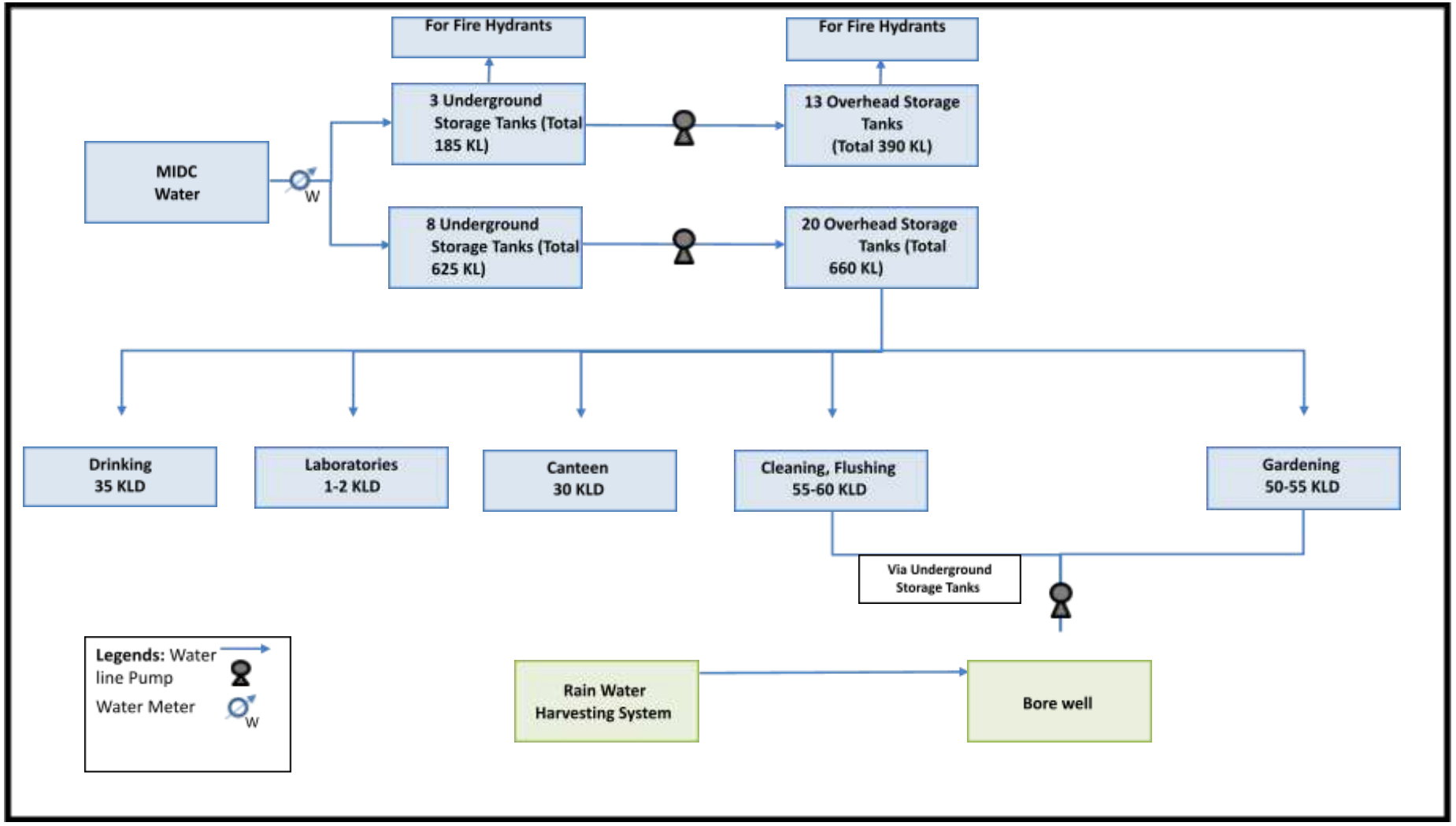
Eighth floor



Ninth floor


Hostel Rooms
Hostel Rooms
Washrooms
OPEN TERRACE
8TH & 9TH FLOOR PLAN FR BOYS HOSTLE
121
228
125
14
Hostel Rooms
Washrooms
Washrooms
Hostel Rooms
Solar Panels on Terrace
PROPOSED BUILDING NO. 6
8TH & 9TH FLOOR PLAN FOR GIRLS HOSTLE
BUILDING NO. 4
9TH FLOOR PLAN
PROPOSED BUILDING NO. 1
MANAGEMENT INSTITUTIONAL BUILDING
PROPOSED 8TH & 9TH FLOOR PLAN
HOSTLE FOR BOYS & GIRLS
RESIDENTIAL SCHOOL BUILDING NO. 7

Annexure 2: Water Distribution Diagram



Daily water usage is around 125 KL as per water bills which is approximately 21L /per person per day

Annexure 3: Indoor Gardening Details

Indoor plants are commonly used for their aesthetics benefits and they also have vital role reducing airborne pollution. The right choice of plants can be an excellent way of improving indoor air quality and general health. Local landscape contractor can be contacted for supply and rotation of these plants.

Plants	VOC it removes	Indoor source of VOC's	Plant care
 **Aloe Vera**	Formaldehyde, Trichloroethylene and Benzene	Chemical based cleaners and paints	Easy to grow with enough sunlight
 **Bamboo Plant**	Formaldehyde, Trichloroethylene and Benzene	Paints, Plastics, Wood products etc.	Thrives under low light conditions as well as easy to maintain
 **Chinese Evergreen**	Benzene	Paints	Low maintenance plant that prefers low light conditions.
 **English Ivy**	Formaldehyde, Benzene, Air borne faecal matter particles	Wood, Paper products, Air borne faecal – matter particles from pests	Easy to maintain

 **Janet Craig**	Formaldehyde, Benzene and Trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
 **Golden Pothos or Devils Ivy**	Formaldehyde, Cleanses air	Exhaust fumes, carpeting materials, panelling and furniture products made with particle board	Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.
 **Mass Cane**	Formaldehyde, benzene and trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
 **Snake plant**	Formaldehyde and trichloroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.

 **Peace Lily**	Formaldehyde, benzene and trichloroethylene	Paints, Plastics, Wood products etc.	Relatively easy to maintain. Survives in low light conditions.
 **Red-edged Dracaena**	Formaldehyde and trichloroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety of light conditions. Hard to damage or kill.
 **Spider Plant**	Formaldehyde, benzene, carbon monoxide and xylene	cooking fuels, wood products, Printing	Easy to maintain under medium to bright light condition.
 **Parlor Palm**	Purifies indoor air	-	Easy to maintain

Annexure 4: Green Audit Checklist

Good Daylight Design

Sr. No.	Design Feature		Remarks (if any)
1	Broad door opening	✓	
2	Clerestory/ High windows	✓	
3	Openings at the eastern and southern side	✓	To maximize sun use openings should at eastern and southern side
4	Rectangular building so that sunlight can reach all areas	✓	
5	Sunshade	x	
6	Double or triple glazing on windows	x	This will reduce the outside noise.
7	Enough illumination	✓	
8	Light colored fabric curtain or blind for window covering	✓	
9	Operable/ openable windows	✓	
10	Ultraviolet (UV) filtering windows	✓	Black Tinted windows can reduce the UV rays.
11	Use of exterior louvers to control glare	x	
12	Use of glass as facilitator of natural light	✓	
13	Use of insulated and tinted glass to filter heat gain	✓	

Ventilation

Sr. No.	Design Feature		Remarks (if any)
1	Downdraft cooling system (a downward flow of air)	x	
2	Ceiling height	✓	Height - 3.6 meters, Ground floor - 4.2 meters
3	Self-movement ventilators in the roof	x	
4	Wide corridors	✓	
5	Operable windows	✓	
6	Use of exhaust fans	✓	Exhaust fans are provided only in canteen and laboratories. Exhaust fans may be provided in washrooms.

Temperature and Acoustic Control

Sr. No.	Design Feature		Remarks
1	Earth air tunnel (cools air in summer and heat it in winter)	-	
2	Roof design & type (Double/ Mud/ Tiled/ Asbestos etc.)	-	
3	Sand stone cladding outside the walls	✓	

4	Special walls for temperature control (Thick/Double/cavity/fire/composite /green)		They have provided tiles on exterior which helps in temperature control.
5	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)		

6	Use of insulation material (e.g. autoclaved aerated blocks, hollow blocks, Thermocrete or higher R-value material)	x	
7	Use of water bodies/fountain		
8	Climbing creepers fitted to window in summer	x	
9	Lime coating for cool roof	-	
10	Retrofitting the existing roofs with cool roof technology	-	
11	White wash on the roof		
12	Use of landscaping as sound barrier		Trees and shrubs planted in the Campus.

Water Efficiency & Wastewater Management

Sr. No.	Measures		Remarks (if any)
1	Aerators to water taps		Aerator taps were observed only in ground floor staff washroom.
2	Automatic toilet faucets	x	
3	Drip irrigation (for plant watering system)		
4	Dual flush toilet with cistern	x	Dual flush is important for reducing water footprint.
5	Efficient plumbing system		Maintenance Department is Available.
6	Sewage treatment plant for sewage recycle	x	Campus is connected directly to MIDC.
7	Rainwater harvesting		
8	Regular maintenance for leakage free plumbing system		In-house Plumber is present.
9	Use of low flow/flow control water equipment or gadget	x	
10	Water free urinals (No flush urinals/Zero flush urinals/Water less urinals/air based flushing system these save water used in toilet)	x	

Energy Efficiency and On-site Energy Generation Mechanism

Sr. No.	Measures		Remarks (if any)
1	Avoid excessive lighting	x	Multiple lights are present on ground floor corridor for aesthetic purpose.
2	Computerized monitoring of electrical system	x	
3	Integrated energy saving design for natural cooling/heating		Building exterior walls are of tiles.
4	On-site energy generation		Diesel Generators, solar power generation are available.
5	Photocell occupancy sensor for automatic light control	x	
6	Regular maintenance of electrical system		
7	Use of day lighting system		

8	Use of energy efficient equipment	x	1 and 3-star ACs are presents. Refrigerators are without any ratings. Campus has limited LEDs.

9	Use of energy saving bulbs (Compact florescent light/LED lights)		34% of the total lights are LED.
10	Solar panel		Solar energy is used for Street lights.

Waste Management

Sr. No.	Measures		Remarks (if any)
1	Sale of books to its user for minimal charges		Send books and used papers to recycling organization.
2	Printing on both sides of paper		
3	Reuse of printed paper/ envelops		
4	Segregation of dry and wet waste	x	
5	Setting up recycling area/ composting area		
6	Creation of specified junctions for collection of E-waste(E-waste)	-	
7	Donation of computers to NGO's to refurbish and give it to needy people		
8	Hand over to organization or recycler who knows proper disposal system		Paper waste is handed to recycler. E-waste is given to the dealer based on buy-back policy.
9	Implementation of any recycling project or program	-	
10	Purchase of electronic products from company's which have after sales service for the disposal of product with buyback policy		
11	Installation of bins to collect garbage		
12	Outsourcing recycling of garbage to agency		
13	Recreating in to new sustainable products	x	
14	Use of colored bins with code to collect garbage		Colored bins are present only in canteens and not in classrooms or corridors.

Environmental Audit

Sr. No.	Type of audit		Remarks
1	Energy audit (includes energy consumption, thermal comfort, visual comfort)		Campus has carried out energy audit in May 2019 and energy audit report is received. Campus should comply with the recommendations given.
2	Sound/ Noise audit (includes indoor noise level, outdoor noise level)	x	
3	Water and waste audit (includes water quality, solid waste generation, solid waste disposal process)	x	

Universal Access and Efficient Operation and Maintenance of Building

Sr. No.	Design feature		Remarks
1	Easy access to the main entrance of the building	✓	
2	Elevator	✓	Accessible for all
3	Preferred car park spaces for specially abled	✓	
4	Ramp/ stairs with handrails on at least one side	✓	Some of the stairs do not have handrails. Handrails to be installed on all staircases.
5	Restrooms (toilets) in common areas	✓	
6	Uniformity in floor level	✓	
7	Audio guidance for specially abled	x	
8	Availability of wheel chair	✓	
9	Braille assistance for specially abled	x	
10	Personalized services by staff for differently abled	✓	
11	Visual warning signage in common and exterior areas	✓	
12	Follow standard procedures for commissioning of electrical/plumbing system	✓	
13	Purchase of standardized and quality material for repair	✓	
14	Regular maintenance of building	✓	In-house maintenance Department is present.
15	Use of chemical free products for cleaning	x	
16	User awareness program to minimize damage of property	✓	

Green Program

Sr. No.	Green program		Remarks
1	Buying recycled material	✓	
2	Creation of “Green Team” in the institution/library	x	
3	Campus conduct program by library science/Any other department e.g. “Eco-Friendliness: Changing our communities’ one step at a time.”	✓	
4	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	✓	
5	Providing external membership to small and local libraries (MOU with other colleges, -internal collegiate library loan)	x	
6	Recycling beyond books i.e. paper, aluminum, plastic, e-waste	✓	E - waste is used for Component lab and students’ projects.
7	Reduce, Reuse and recycle of the products (At the time of disposal of library material)	✓	
8	Availability of books/ magazines and online resource guide related to sustainability & Green Practices (energy/water conservation)	✓	

9	Contribute library information on sustainability resources to Campus publication, blog or website		Promote eco-friendly activities, post information related to sustainability, energy conservation, etc.

10	E Publishing reviews of new green resources in the newsletter or news	P	
11	Digitization		
12	E-archiving		
13	E-resources : E books, Online Journals, membership of consortium		

 : Provided P: Planned - : Not Applicable x: Not Provided

Mahatma Education Society's,
Pillai HOCL Educational Campus,
Rasayani

Green Audit Report

PREPARED BY:

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Green Audit Report of Mahatma Education Society's, Pillai HOCL Educational Campus, Rasayani, has been prepared by STEP based on visit to the Campus, checking records and interactions with faculty, non-teaching staff and students. No intrusive study was conducted during the audit.

Preliminary reconnaissance audit of the Campus was performed on **May 30, 2019** and detailed audit was conducted on **June 15, 2019.**

The green audit report presents green initiatives followed and taken up by the institution, and provides suggestions and recommendations to improve environmental sustainability.

Ms. Jyoti Palekar Managing Director STEP Pvt. Ltd.	Ms. Ankita Parab Sustainability Engineer STEP Pvt. Ltd.	Mr. Tejinder Jethra Environmental Engineer STEP Pvt. Ltd.	Dr. Sudhan Rajput Consultant STEP Pvt. Ltd.

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1. Introduction:

Mahatma Education Society's, Pillai HOCL Educational Campus, Rasayani (Campus) was established in the year 2008. It is one of the six Campuses of Mahatma Education Society, a non-profit organization managing 48 educational institutions. 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 Polytechnic (PHP) (2009), and Pillai HOC College of Education and Research (PHCER) (2010).

The Campus has 5737 students enrolled and 281 teaching faculty and staff members on its payroll. The Colleges offer various courses listed below:

Pillai HOC College of Architecture (PHCA)

- Bachelor of Architecture (B.Arch.)

Pillai HOC College of Engineering and Technology (PHCET)

- Bachelor of Automobile Engineering
- Bachelor of Civil Engineering
- Bachelor of Computer Engineering
- Bachelor of Electrical Engineering
- Bachelor of Electronics and Telecommunication 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)

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 (B.M.M.)
- 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.)
- Master of Commerce in Accountancy (M.Com.)
- Master of Science in Information Technology (M.Sc. I.T.)

Pillai HOC Polytechnic (PHP)

- Diploma in Civil Engineering
- Diploma in Computer Engineering
- Diploma in Electronics and Telecommunication Engineering
- Diploma in Mechanical Engineering

Pillai HOC College of Education and Research

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

Prior to the green audit (audit), questionnaire and checklist were prepared. During the audit STEP team visited entire Campus area i.e. classrooms, laboratories, library, washrooms, staff rooms, administration department, computer laboratories, placement cell, canteen, etc.

Campus Information

The Campus has interconnected buildings. For ease of auditing, the Campus was audited floor wise and the data has been collected. Campus building has 9 floors. The floor wise layout is presented in **Annexure 1**.

Floor wise Facilities of Campus	
Floor	**Facilities**
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	Conclave I, Principal's Cabin, IQAC 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	Conclave II, Counseling Room, 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 Room, 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

During Audit, STEP team interacted with following stakeholders:

Name	**Department**
Dr. Lata Menon	Dy. CEO and Principal PHCASC
Dr. Madhumita Chatterjee	Principal, PHCET
Dr. Chelpa Lingam	Former Principal, PHCET
Dr. Jagannath Nalawade	Head of Department, Information Technology
Ms. Divya Chirayil	Head of Department, Electronics and Telecommunication
Mr. Pragnesh Shah	Professor, Electronics and Telecommunication and Liaison Officer
Mr. Sunil Nair	Canteen In-charge
Ms. Monisha Mohan	Assistant Professor, Information Technology
Ms. Arya Pillai	Lecturer, Civil Engineering
Ms. Neha Rane	Examination In-charge, Examination Department
Mr. Rakesh Murali	Maintenance and Hardware
Mr. Rakesh Patil	Fire Office Maintenance
Mr. Chandrashekhar Nair	Lab Assistant, Basic Electronics Lab
Mr. Yogesh Maho	Lab Assistant, Civil Engineering Lab
Mr. Kalpesh Palekar	Lab Assistant, Machine Shop
Ms. Navneet Sandhu	Librarian
Mr. Sagar Pundalik	Librarian
Mr. Vaibhav Kanoje	Student
Mr. Pritesh Dhawale	Student
Mr. Jeffery Albert	Student
Mr. Siddhesh Mane	Student
Mr. Smit Pandya	Student

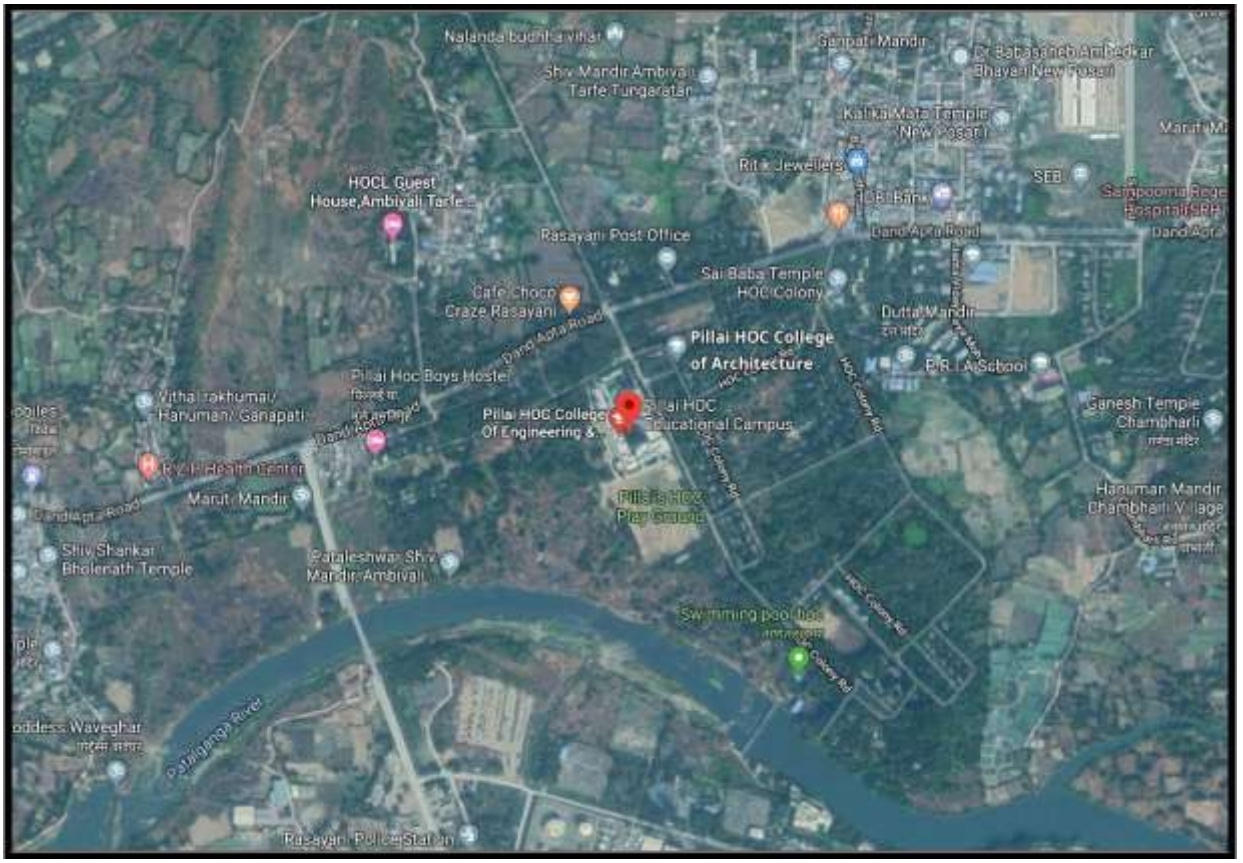
Further, STEP team interacted with following stakeholders over telephone:

Name	**Department**
Dr. Pradeep Chatterjee	Director, PHIMSR
Ar. Suchita Sayyaji	Principal, PHCOA
Prof. Amar Mange	Principal, PHP
Dr. T. A. James	Principal, PHCER

2. Environmental Setting:

Campus is situated at the entry of Hindustan Organics Chemical (HOC) Colony. Campus is spread across 14.2 acres (57465.36 sq. m.) It is at a distance of 4.5 km from Rasayani station, which is the nearest railway station, and about 16.5 km from Panvel railway station. The surroundings of Campus have a green belt, HOC hospital & HOC colony. Patalganga River is situated at the back of Campus about 150 m away.

Pillai HOCL Educational Campus, Rasayani



Location of Pillai HOCL Educational Campus, Rasayani

3. Green Audit:

For Green Audit following 13 major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified/ validated.

a) Good Daylight Design
b) Water Efficiency
c) Wastewater Management
d) Indoor Air Quality and Ventilation
e) Energy Efficiency
f) On-site Energy Generation
g) Temperature and Acoustic Control
h) Paper Waste Management
i) E-Waste Management
j) Canteen and Solid Waste Management
k) Universal Access and Efficient Operation and Maintenance of Building
l) Green Belt
m) Green Programs (Green initiatives)

STEP team reviewed each of these aspects across the Campus. Based on the review, we are providing our observations for each aspect.

Good Daylight Design
Observations:

a) Corridors are wide with good ceiling height. All the corridors receive good daylight. Classrooms, Labs and Library have high ceiling with wide doors and large windows. Windows are kept open to get adequate daylight.
b) Classroom walls, corridors and labs are painted with plastic emulsion paint, this enhances the daylight received.
c) Curtains are provided on some of the windows to avoid glare.
d) Chemical Laboratory is provided with flame-proof exhaust fans to disperse heat, fumes and odor. Flame- proof exhausts were seen in the canteen kitchen.
e) Staircases are designed in such a way that diffused sunlight enters but blocks the heat.

Good ceiling height and exhausts in Chemical Laboratory

Daylight in Library

Staircase receive good daylight

Good daylight and Ventilation in classrooms

Water Efficiency:

Observations

4 Campus uses water from bore wells and that supplied by Maharashtra Industrial Development Corporation (MIDC) to meet its general needs. MIDC Charges ₹20 for 1000 L of water. The water consumption of March and April 2019 is graphically represented in **Figure 1**. Average water consumption for March and 2019 is 3739 KL/ month (125 KL/day). This works out to be 21L/person/day, which is very normal and comparable to standards (http://dasta.in/wp-content/uploads/2015/04/CB_Code_2002.pdf).

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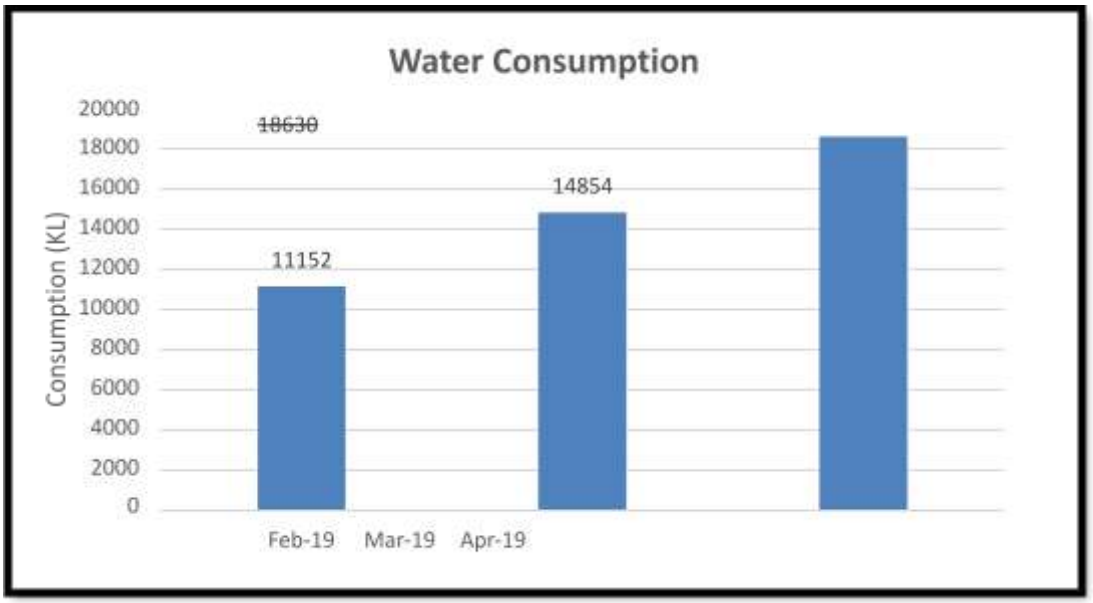


Figure 1 Water Consumption- Campus

a) Water received from MIDC is stored in underground and overhead storage tanks.

Water Storage Tanks Location	Quantity	Total Capacity
Underground	11	810 KL
Overhead	33	1050 KL
Total capacity	44	1860 KL

b) From underground storage tanks water is pumped to the overhead tanks located on building terrace, from where it is distributed to washroom basins, laboratories, and for drinking after purification. The water distribution diagram is presented in **Annexure 2**. Daily water usage is around 125 KL (as per water bills).

c) 'Rainwater harvesting system' is installed in the Campus. Rainwater from roofs/ terrace is collected through a well-designed network of pipes in underground tanks. The pipes carry water into specially constructed recharge pits to recharge aquifers and tube well. Water from tube well and water collected from rainwater harvesting system (during rainy season) is used for gardening, flushing in toilets; and for fire water makeup.

d) Average rainfall in Rasayani is 3267 mm per annum. Based on this, rainwater harvested by the Campus was calculated as 18, 662 cubic m. approximately. Part of harvested water is stored in underground storage tanks and rest is used to recharge aquifers & tube well.

e) Water coolers & purifiers are installed at drinking water supply points.

f) Normally mops are used for floor cleaning. Floors are mopped once in a day.

g) Few washrooms have water saver faucets. Installation of water saver faucets in all toilets can save water and will help in minimizing the water footprint of the Campus.

h) Dual flushing system is not provided in the washrooms. Water saving due to dual flushing system can be upto 30%.

i) If water leakage is observed, in-house maintenance team immediately attends to leakage. Records of such leakage complaints can be maintained to quantify water saved.

j) No Signage is provided in washrooms emphasizing water conservation.

Rainwater Harvesting System- Recharge Pit

Signage near Water purifier/ cooler

Wastewater Management:

Observations:

Wastewater is mainly generated from toilet flushing and canteen. There are total 146 washrooms in Campus.

a) Sanitary wastewater generated from washrooms and wastewater from canteen and Laboratories is connected to sewerage system provided by MIDC.
b) Wastewater/ sewage recycle is not practiced in Campus as grey water/ sewage treatment /recycle facility is not provided.
c) Campus has proposed to install sewage treatment plant.

Indoor Air Quality & Ventilation:

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutants are listed as below:

- Molds and other allergens – This may arise from water seeping into the building envelope or skin, plumbing leaks, condensation due to improper ventilation, or from ground moisture penetrating a building part.
- Volatile Organic Compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities

Observations:

a) In the classrooms the mode of ventilation is natural draft through windows. Fans are provided to improve air circulation. A few rooms/ labs e.g. offices, computer labs, computer server room are air conditioned.
b) Heating Ventilation and Air Conditioning (HVAC) system are present only for auditoriums.
c) Smoke detectors were not seen but fire alarms were present on each floor.
d) Exhaust fans are provided only in Chemistry Laboratory.
e) Very few indoor plants were seen in Campus. Some artificial plants were seen in buildings, these can be replaced by indoor plant. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer **Annexure 3** for details.
f) Green belt has been set up in Campus area.

Energy Efficiency:

Electricity:

The major energy consumed is through electricity usage. The Campus has one common electricity meter. Electricity is provided by Maharashtra State Electricity Distribution Co. Ltd. The monthly average electricity consumption from March 2018 to May 2019 is around 52,270 KWh (Units). Electricity consumption of the Campus is graphically represented in **Figure 2.**

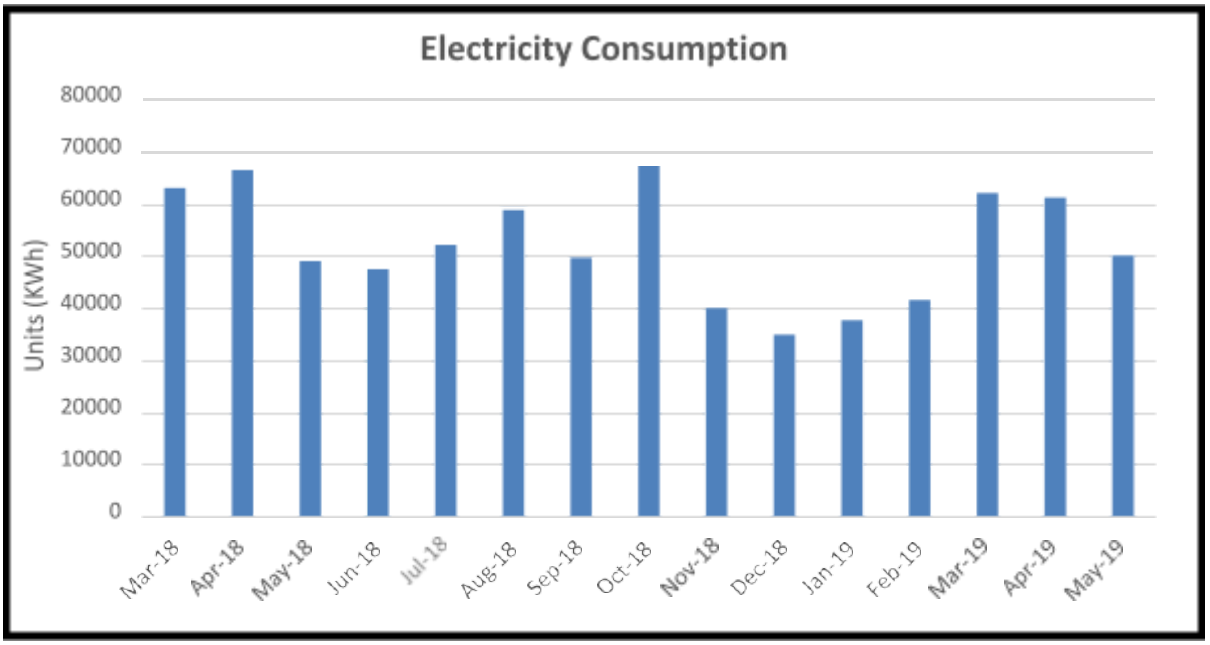


Figure 2 Electricity Consumption- Campus

The above graph indicates that the maximum energy consumption is in the month of October 2018 followed by March 2018 and the minimum energy consumption is in December 2018. This may be due the colleges having holidays in December-January each year. A slight decrease in energy consumption is observed (3%) from 2018 to 2019 due to increased use of energy saving devices like LED bulbs and tubes instead of conventional CFLs and tube lights. Due to replacement of tube lights/ CFLs with LEDs, Campus has saved Rs. 14385.00.

The areas of major electricity consumption of electricity are:

Areas of consumption	Quantities
Tube lights & CFL	3878
Light Emitting Diode (LED)	2137
Fans	2171
Air Conditioners	122
Computers	1148
Printers	102
Projectors	45
Refrigerators & Deep freezers	4
1 Phase machines	21
3 phase Machines in labs	54
CCTV	202
Television	6

The list of electrical appliances and possible energy intensive areas in the Campus is provided in **Annexure 4**.

Observations:

a) Conventional tube lights, LEDs & fans are installed in classrooms and labs.
b) Campus has carried out energy audit in June 2019 and energy audit report is not yet received. Campus should comply by the recommendations given therein.
c) Around 34% lights present in Campus are LED. LED lights save energy up to 75% and also, they are 25 times durable than incandescent lights. Campus is in the process of replacing periodically the dysfunctional conventional tube lights with LED lights.
d) Campus has few air conditioners with one-star and three-star ratings- standards set by Bureau of Energy Efficiency (BEE). Around 10 old air conditioners present are without any ratings.
e) Refrigerators are installed in canteen and laboratories. They are without any ratings.
f) Uninterrupted Power Supply (UPS) system is provided in some computer laboratory. UPS system is typically used to protect computers, data centres, telecom equipment or other electrical equipment where an unexpected power disruption could affect the work or lead to data loss.
g) Tube lights do not have reflectors. Reflectors can reduce electricity consumption.
h) All the computers have LED screens; Computers are shut down when not in use. Signage for the same was also put up on the wall.
i) Separate switches are provided for tube-lights and fans in all classrooms. So, it is possible to switch on/ off a specific light or a fan and to avoid wastage of energy due to common area illumination.
j) Signage is present near some electrical switch boards to encourage users to switch off light and fans to save electricity.

Air Conditioner with 3 star rating

Signage above switch board

On-Site Energy Generation (usage of LPG/ Natural Gas):
Observations:

a) LPG cylinders are used in the canteen for cooking. On an average 3 cylinders of 19 kg are required per day. 1 cylinder of 19 kg will generate 881.6 MJ (Mega Joules) of energy; hence total energy generation will be 2644.8 MJ.
b) The LPG cylinders were stored horizontally. Cylinders must be prevented from falling, movement or physical damage by storing them in approved cages/racks, securing the cylinders with safety chains or using other approved retention methods for LPG gas cylinder safety.

(http://peso.gov.in/Work_Mannual/Gas_cylinder_Rule_WM.pdf)

c) Campus has 2 Diesel Generators of 250 KVA for backup in case of power failure. These are sufficient as the power demand of the Campus was 480 KVA from April 2018 to Mar 2019.

d) Campus has installed solar panels of capacity 10 KWP (Kilowatt Peak for solar is the rate at which energy is generated at peak performance) by 'JYOTITECH Solar LLP' to promote use of renewable energy. This energy is used for street lights within the Campus.

Diesel Generators

Roof-top Solar Panels

Temperature and Acoustic Control Observations:

a) Campus is located inside the HOC Colony. There is no noise pollution as there are few vehicles on the road.

b) Acoustic control walls are provided in auditorium and Conclaves.

c) Trees are planted in the Campus which may help in reducing temperature and abating noise pollution.

d) Maintenance free tiles are used all over the exterior walls of buildings which eliminate the cost of painting and makes the building leakage free. These tiles reflect sun rays thus help in keeping the inside temperature cool.

Green belt in Campus

Maintenance free tiles for building

Paper Waste Management:

Being an academic institution, waste paper is the main solid waste generated in the premises. Campus has taken steps to minimize and avoid paper usage.

Observations:

a) Prints and photocopies are taken on both sides of the paper to avoid excess paper usage. Digitalization (scanning) is also practiced.
b) All libraries have books, newspaper, journals and magazines available for staff and students. They also have E-book system where books and journals are available online. More than 7000 books are available online.
c) Internal communications are through E-mail/SMS.
d) Notices are displayed on the notice boards as well as are made available on the website. Campus has its portal where notices are sent & attendance is recorded.
e) The dissertation reports, journals and answer papers are stored as per the University rules. Most of the storage is in library and staff room. After 3-4 years, old submissions and answer papers are archived and stored in special storage areas on ground floor as per university rules.
f) Old papers are given to 'Jai Bhavani Company, L.P. Nerul' in exchange of new papers in certain ratio as decided by the management. Currently the ratio is 2:1 (old papers: new papers). The selection process is by bidding from different scrap dealers.

Library

Notice board outside Electronics Lab

E-Waste Management:

Observations:

a) Campus is digitalized to a large extent. This includes some classrooms, library, internal mails etc. Campus has E-library, AV classrooms, student & staff portal for academic work, biometric attendance system for staff, lecture recording system, etc.
b) Old electronic instruments are given to the dealer under buy-back policy. Old E-material is used to make components which are used by students for their projects. Campus has a 'Component Laboratory' for the same.

Solid Waste Management:

Observations:

a) Segregation of wet and dry waste was seen only in the canteen. No separate bins were seen for wet biodegradable and dry recyclable waste in rest of the Campus. There is no signage for minimizing food wastage or for promoting segregation of wet and dry waste.
b) Biodegradable waste is mainly generated in canteen. Around 25 kg dry waste and 22-25 kg wet waste is being generated by the canteen daily. Campus has recently installed composting unit where canteen waste is being treated daily.
c) In other areas like classrooms, mostly paper waste and plastic wrappers are generated. Dustbins are provided in classrooms, offices, cabins.
d) Dysfunctional/ broken benches are repaired and reused.

Composting unit

Composting unit - inside

Dustbin for waste collection

Signage for Garbage disposal

Universal Access and Efficient Operation and Maintenance of Building:

Observations:

a) Campus is easily accessible from the road. Staircase is provided for staff and students. Ramps are provided for physically handicapped people.
b) Campus has 13 elevators and 11 staircases for students and staff.
c) Staircases and classrooms have wide windows, which can allow safe evacuation during emergency.
d) Since the access and staircases are wide 2 meter and uncluttered, it is possible to have a safe evacuation by stairs during emergency.
e) Handrails are provided only on few staircases. Handrails are essential to avoid falling in emergency situations.
f) 'Shree Sadguru Krupa Fire Services Pvt. Ltd.' is a service provider for maintaining firefighting equipment. Fire extinguishers and fire hydrants are provided for emergency near staircase and one set near lift. Most of them are inspected and serviced by Shree Sadguru Krupa annually. Some fire extinguishers in Campus were past their servicing / expiry dates. They need to be serviced immediately.
g) There are 13 overhead and 3 underground water storage tanks for firefighting with total capacity of 575 KL.
h) There is no signage for emergency fire exit. This is important for evacuation during emergency.
i) Programs like "Fire Safety & Hazard Management Training' should be conducted annually for staff as well as for students.

Fire extinguisher

Fire alarm

Green Belt/ Landscaping:

Observations:

a) The Campus has an area of 57465.36 sq. m. Plantation helps maintaining lower temperatures of the area.
b) Potted plants are provided in Campus.
c) Very few Indoor plants were observed on ground floor.
d) Vertical Gardening is a possibility on the compound wall of Campus.

Green Initiatives:

Observations:

a) Campus has a 'Nature Club' which organizes different green programs throughout the year.
b) 'Know green and think green' is promoted on Campus by NSS and Nature Club in the institution
c) Campus has installed solar panels of capacity 10 KWP to promote use of renewable energy. This energy is used for street lights within the Campus.
d) Campus has started an initiative under E- waste management. E-waste collection cell has demonstrated the utilization of E-waste to make E-waste concrete.
e) Campus has one rainwater harvesting system. Rainwater harvested by the Campus was calculated as 18, 662 cubic m. approximately.
f) Gardens are watered using drip/ sprinkler irrigation system to save water.
g) Campus had started 'Zero Garbage Initiative' to awareness regarding solid waste management.
h) Canteen solid waste is separated into dry and wet waste. Awareness program has been carried out for canteen workers for waste segregation. 2 bins for dry and wet waste are present in the canteen.
i) "My Green Bin", 2 composting units are installed to compost canteen waste.
j) National Conference on 'Environmental, Economic and Political Aspects of Climate Change' was held on September 8, 2017.
k) Environment Management is included in curriculum for extension and awareness.

E-Waste Management

Mr. Rahim Sheikh is guiding students at the Park

Explaining Composting procedure

Nature Club Activity

4 RECOMMENDATIONS/ SUGGESTIONS:

4.1 For Improving Energy Consumption:

a) Every classroom and lab where central switch board is provided should have a diagram linking place of tube light, fan, etc. with the corresponding switch. This will ensure that correct fitting is switched on/ off, which can save time & unnecessary operation.
b) Conduct energy audit every two or three years and determine the lux levels within Campus, based on which reduction in number of light fittings in the Campus could be considered.
c) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing. Equipment with star rating, made using eco-friendly materials; with safe disposal policy to be preferred. Policy of returning equipment at the end of life span to the supplier may be preferred.
d) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
f) Computers should be switched off from main power connections.
g) Notices/ signage can be put up/ displayed near switches and on notice boards, informing students and staff to switch off all electrical equipment when not in use.
h) Control sensors can help to reduce consumption by automatically dimming lights when people are not around, and keeping blinds open to use natural light & reduce energy consumption.
i) Raise awareness:
   - Encourage students to help in monitoring energy consumption & implement corrective actions
   - Integrate energy education into classroom learning.

4.2 Water Conservation:

j) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption.
k) Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
l) Notices and signage on water conservation could be displayed near washrooms and water coolers.
m) Dry sweep or use a sponge broom when possible, instead of using a hose to clean floors, sidewalks, or other hard surfaces.
n) Minimize/ reduce water usage by installing water saving faucets such as Pressmatic taps, tap aerators, jet sprays, etc.
o) Dual flushing system must be installed for toilet flushing which saves considerable amount of water.
p) Grey water/ sewage recycling system can be installed for flushing water in toilets. This will reduce the fresh water footprint.
q) Installation of waterless urinals should be considered to reduce water consumption.

4.3 Paper and other Solid Waste Reduction:

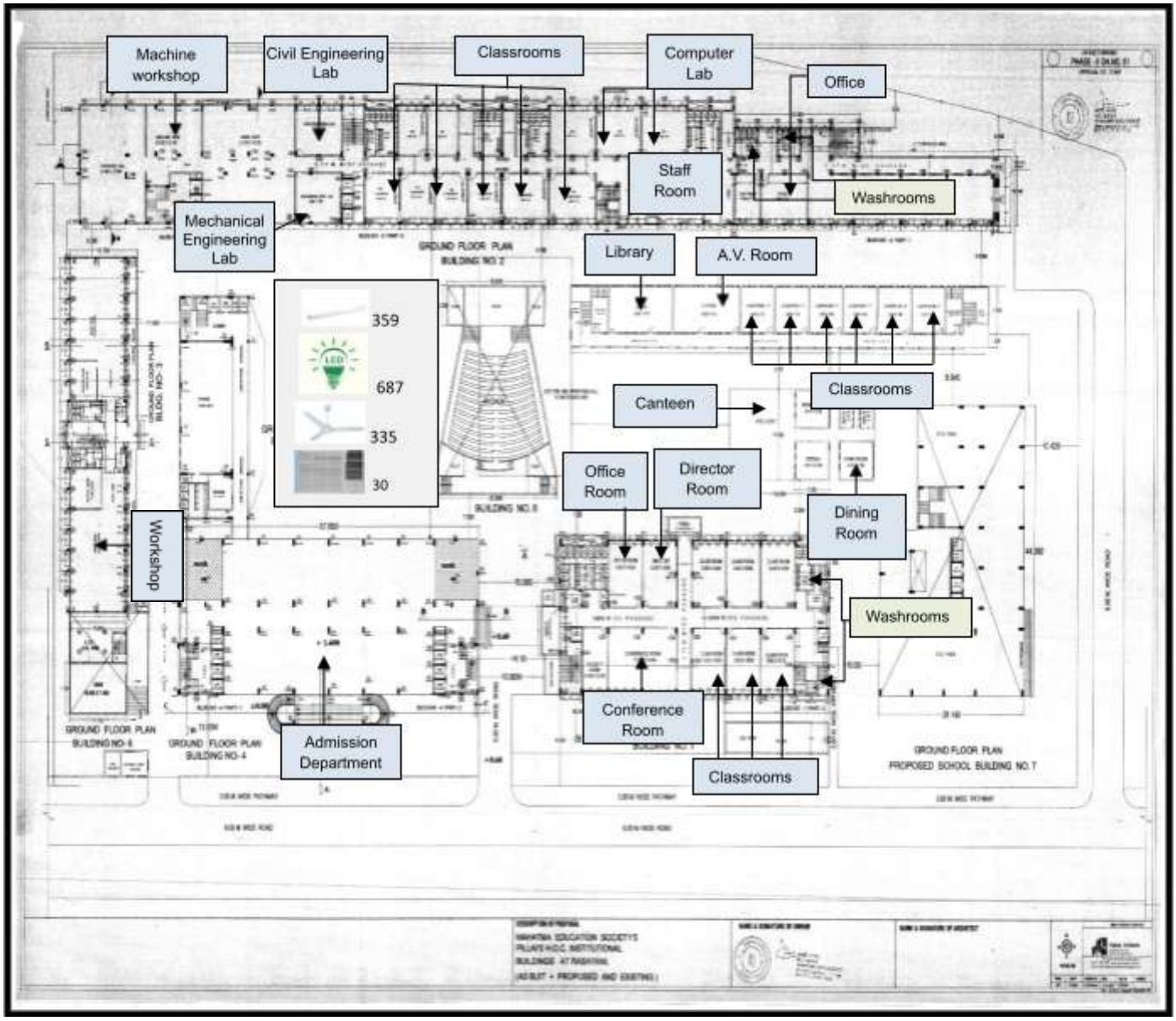
a) Inventories of all solid waste generated in the premises must be maintained to monitor the waste generation.
b) There should be waste segregation practices at each source (currently present only in canteen). Separate bins to be provided.
c) Enhance recycling- An Initiative under Green program could be started by creating a group where students can recycle books, personal clothes and other material to needy students.
d) Standard Operating Procedures (SOP) for Solid and E-waste management and for recycling of waste should be prepared and practiced. The SOP's may include collection, segregation and reuse of different types of wastes, if any (e.g. biodegradable waste for composting). This will help in safe disposal of waste to recycle agencies.
e) Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin.
f) Plastic bottles to be handed over to PET recyclers.
g) Campus can introduce online app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.
h) Paper usage shall be monitored to understand the impact of digitization in the facility.

4.4 Others:

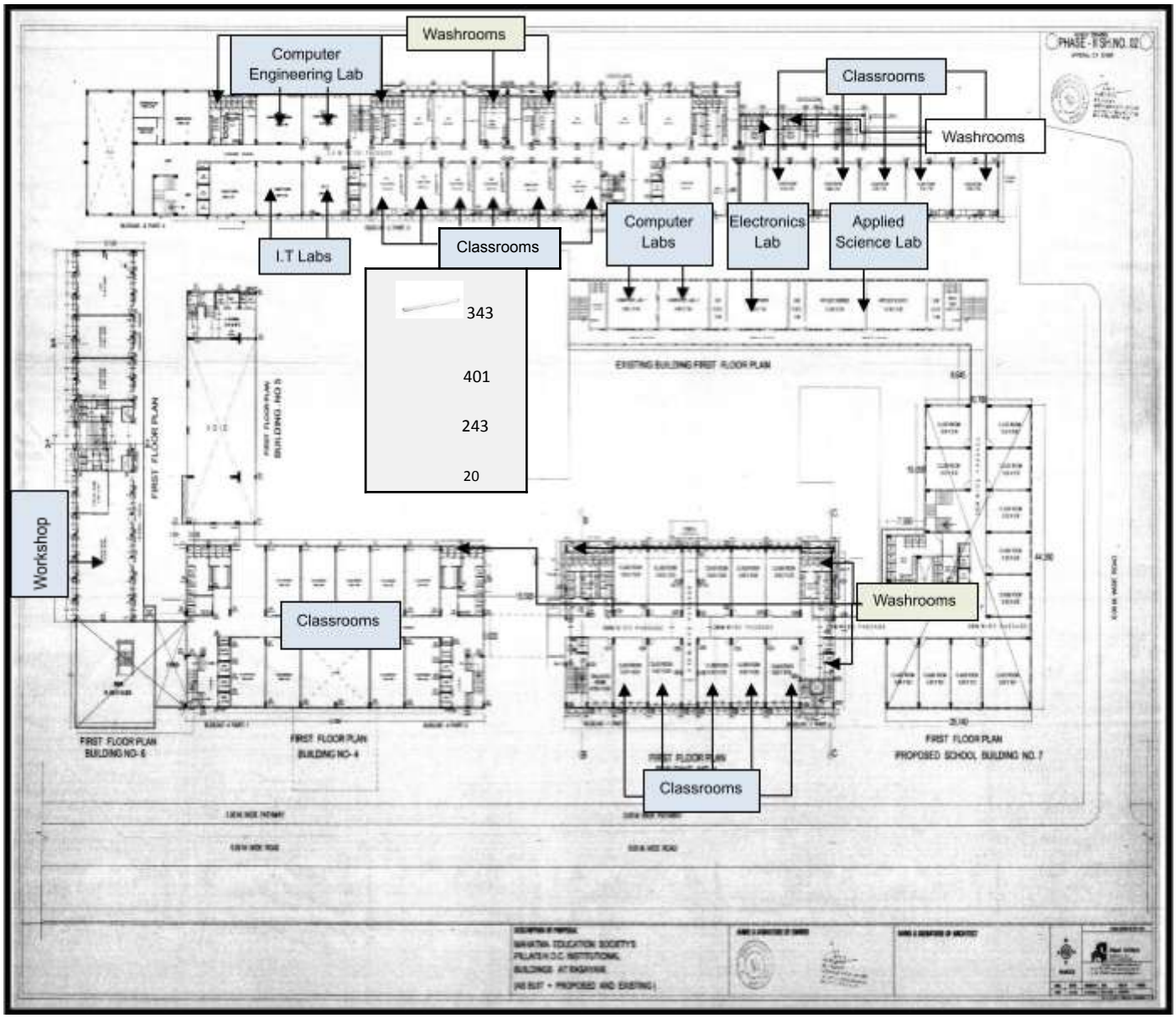
a) Consider setting up an environmental advisory committee with student's involvement. The discussions/ information sharing among different departments can generate ideas and awareness on green issues, which could be implemented.
b) Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes. Set annual targets for Green Initiatives & monitor them closely. Create 'Green Champions'.
c) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation, etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode. Or wallpapers informing students about environment conservation can be created.
d) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decisions.
e) Vertical gardening can be done using indoor plants. Hydroponic garden can be an option where in small space also plants can be planted. Drip irrigation system can be provided for plants.

ANNEXURE 1: Campus Floor Plan

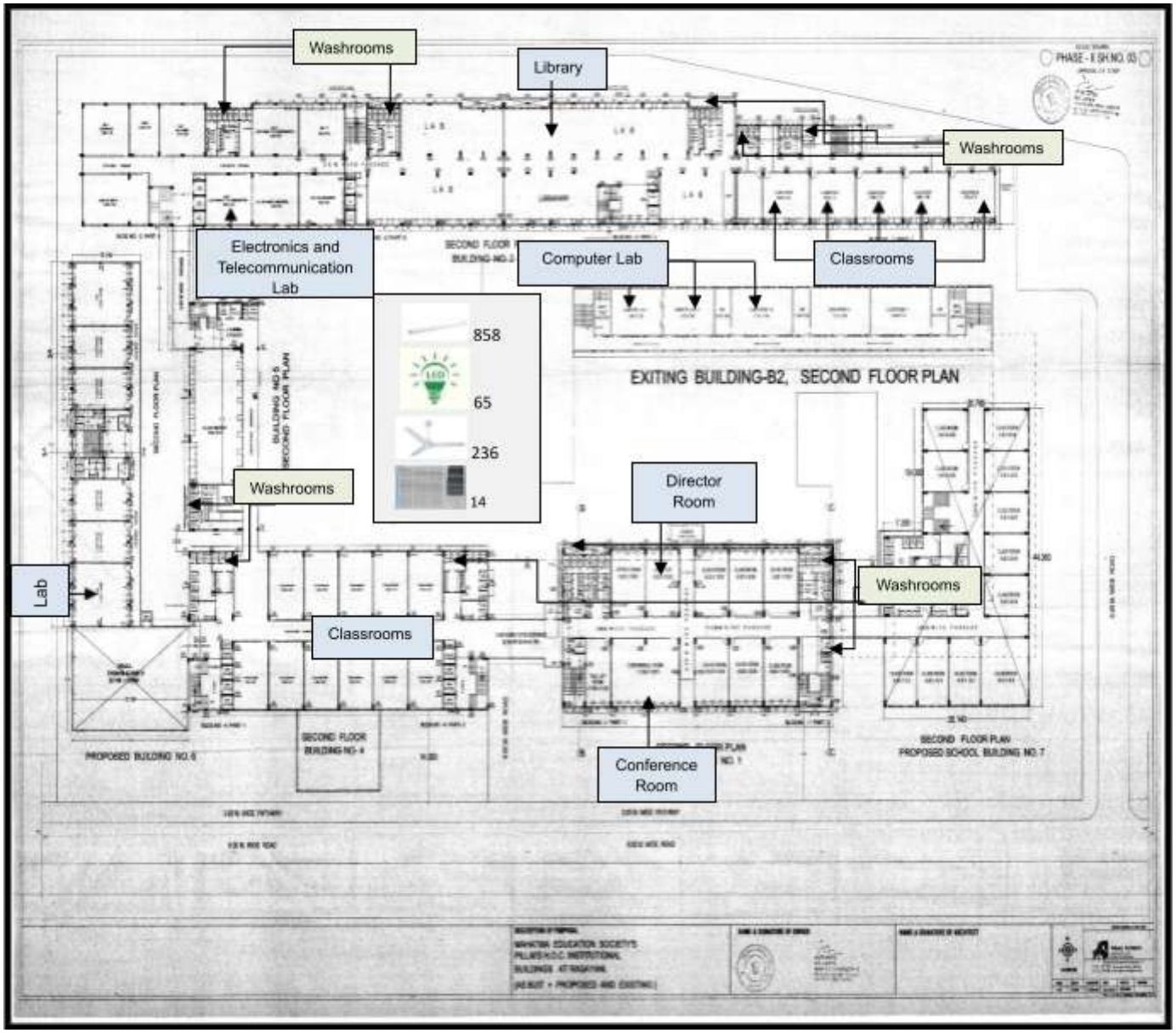
Ground Floor



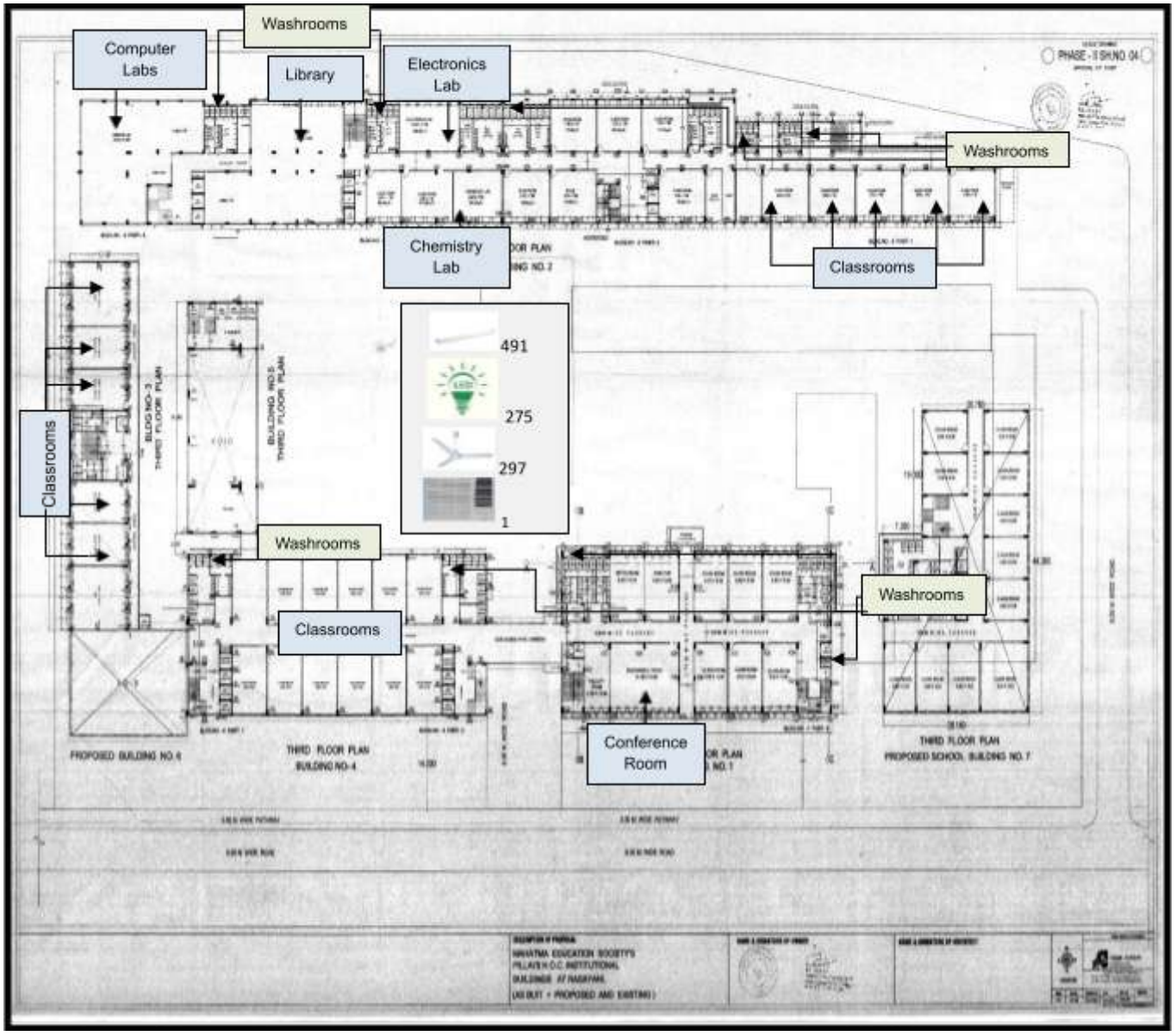
First Floor


Washrooms
Computer Engineering Lab
Classrooms
Washrooms
I.T Labs
Classrooms
Computer Labs
Electronics Lab
Applied Science Lab
343
401
243
20
Workshop
Classrooms
Washrooms
Classrooms
FIRST FLOOR PLAN BUILDING NO- 6
FIRST FLOOR PLAN BUILDING NO- 4
FIRST FLOOR PLAN PROPOSED SCHOOL BUILDING NO. 7

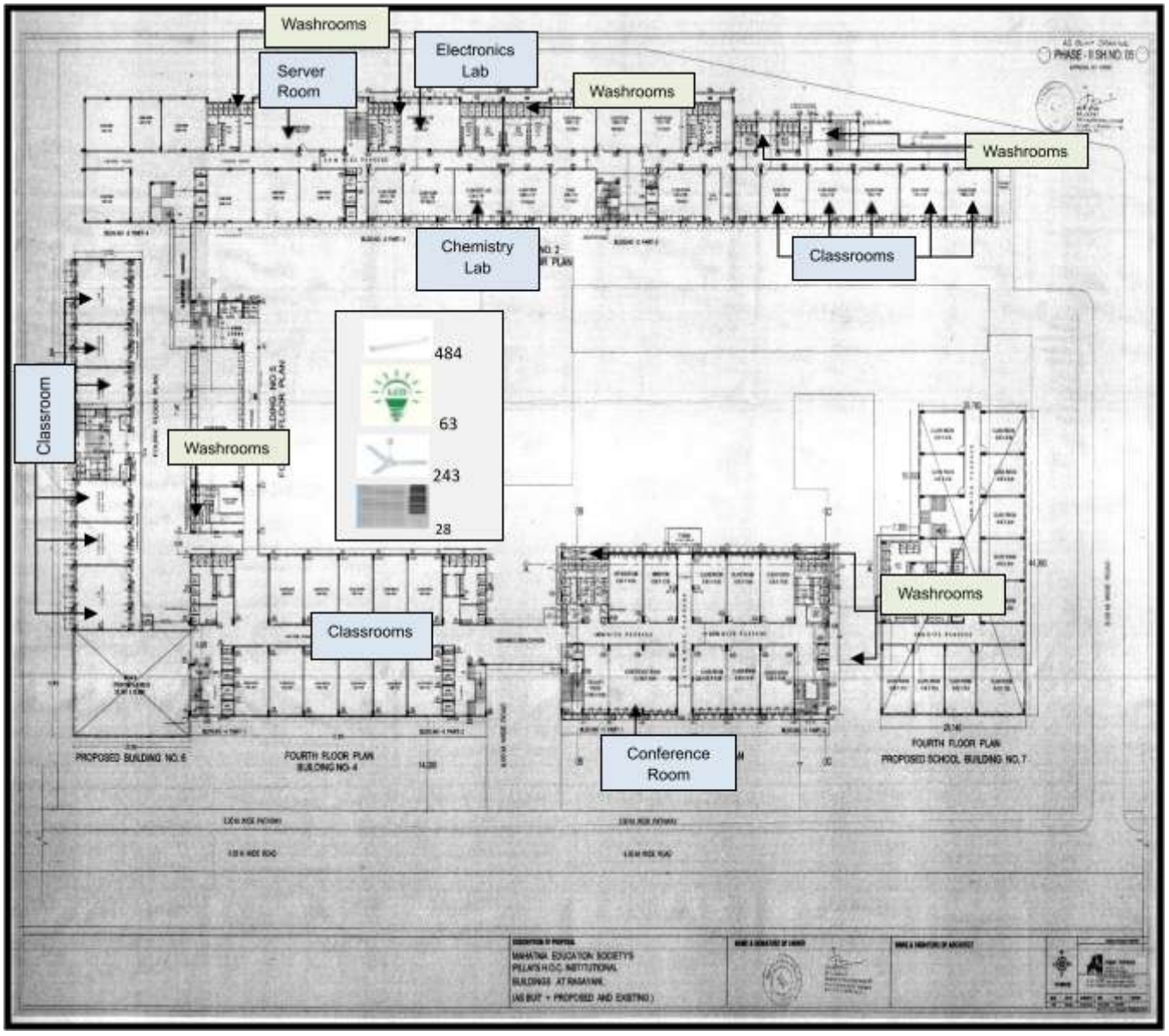
Second Floor



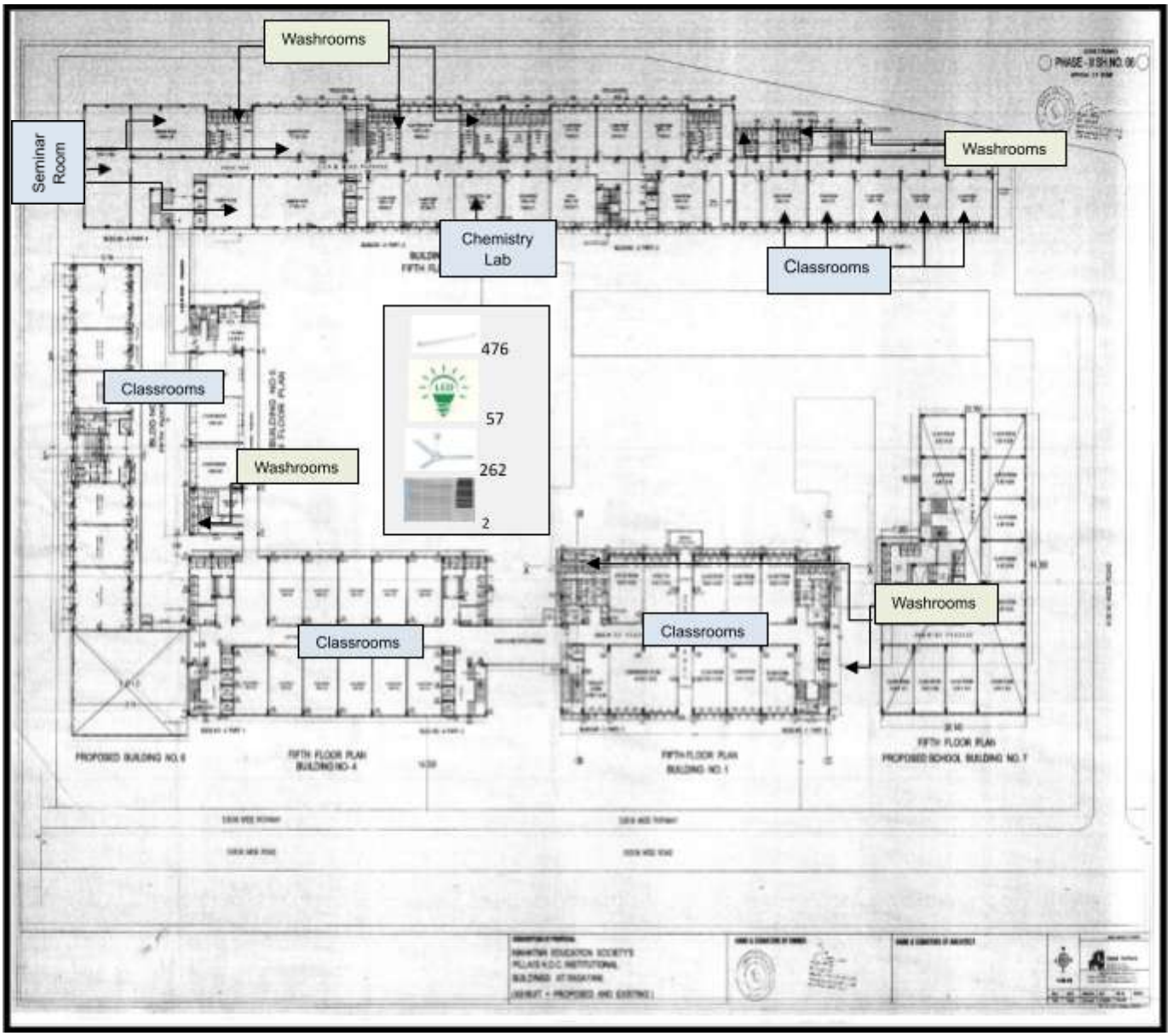
Third Floor


Washrooms
Computer Labs
Library
Electronics Lab
Washrooms
Chemistry Lab
Classrooms
491
275
297
1
Classrooms
Washrooms
Classrooms
Washrooms
Conference Room
PROPOSED BUILDING NO.6
THIRD FLOOR PLAN
BUILDING NO-4
THIRD FLOOR PLAN
PROPOSED SCHOOL BUILDING NO.7

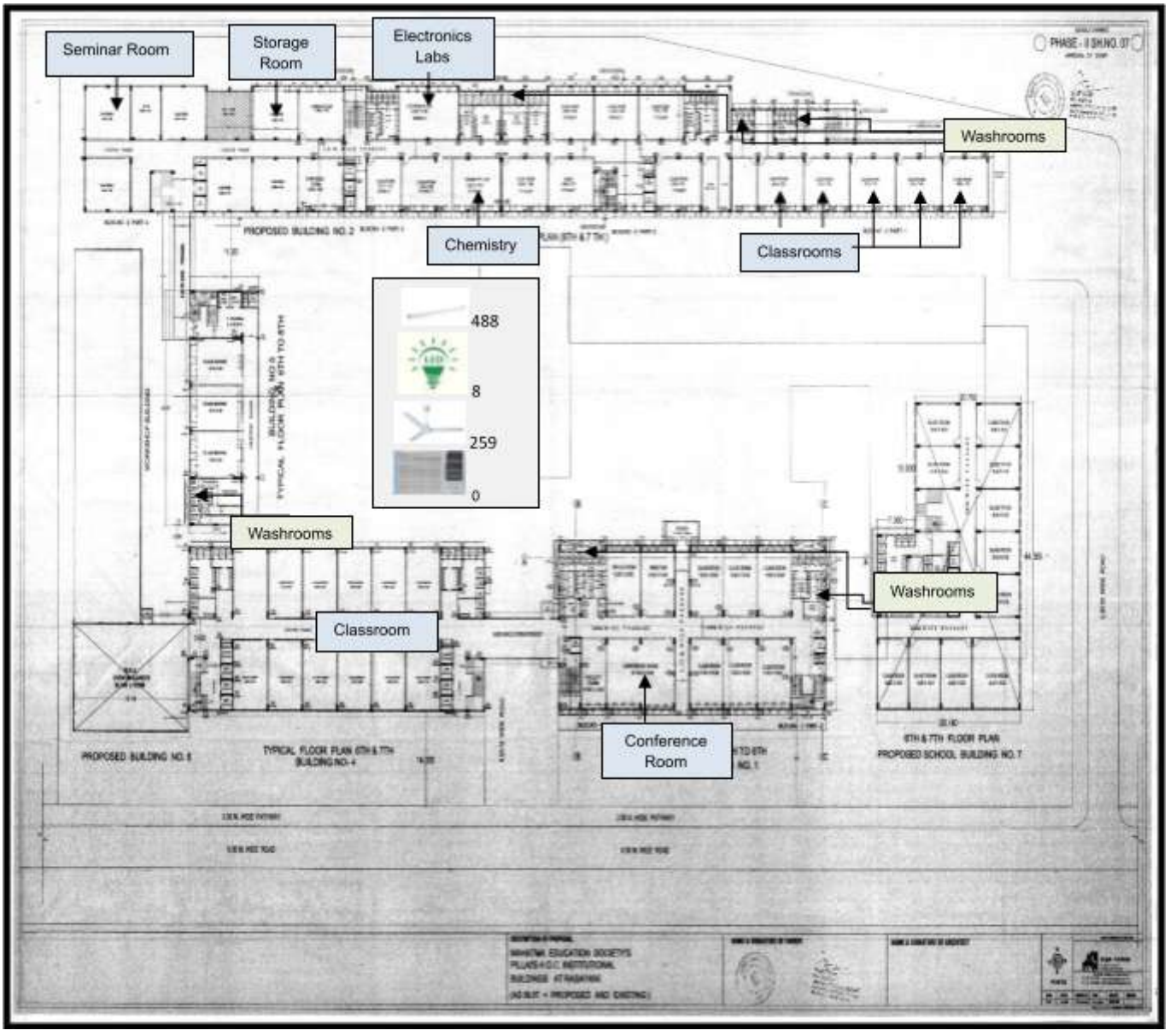
Fourth Floor



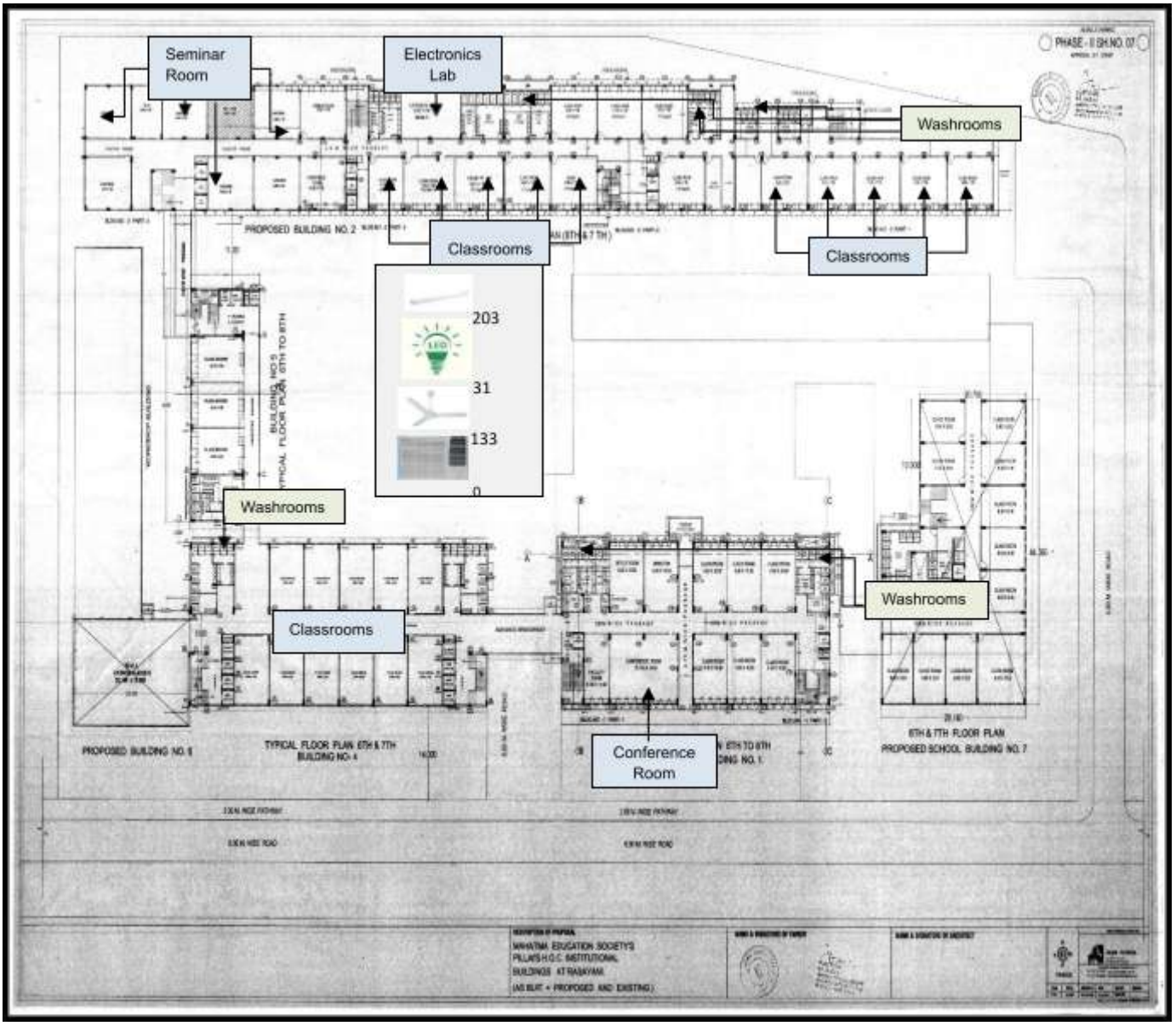
Fifth Floor


Washrooms
Seminar Room
Washrooms
Chemistry Lab
Classrooms
476
57
262
2
Classrooms
Washrooms
Classrooms
Classrooms
Washrooms
PROPOSED BUILDING NO. 6
FIFTH FLOOR PLAN BUILDING NO. 4
FIFTH FLOOR PLAN BUILDING NO. 1
FIFTH FLOOR PLAN PROPOSED SCHOOL BUILDING NO. 7

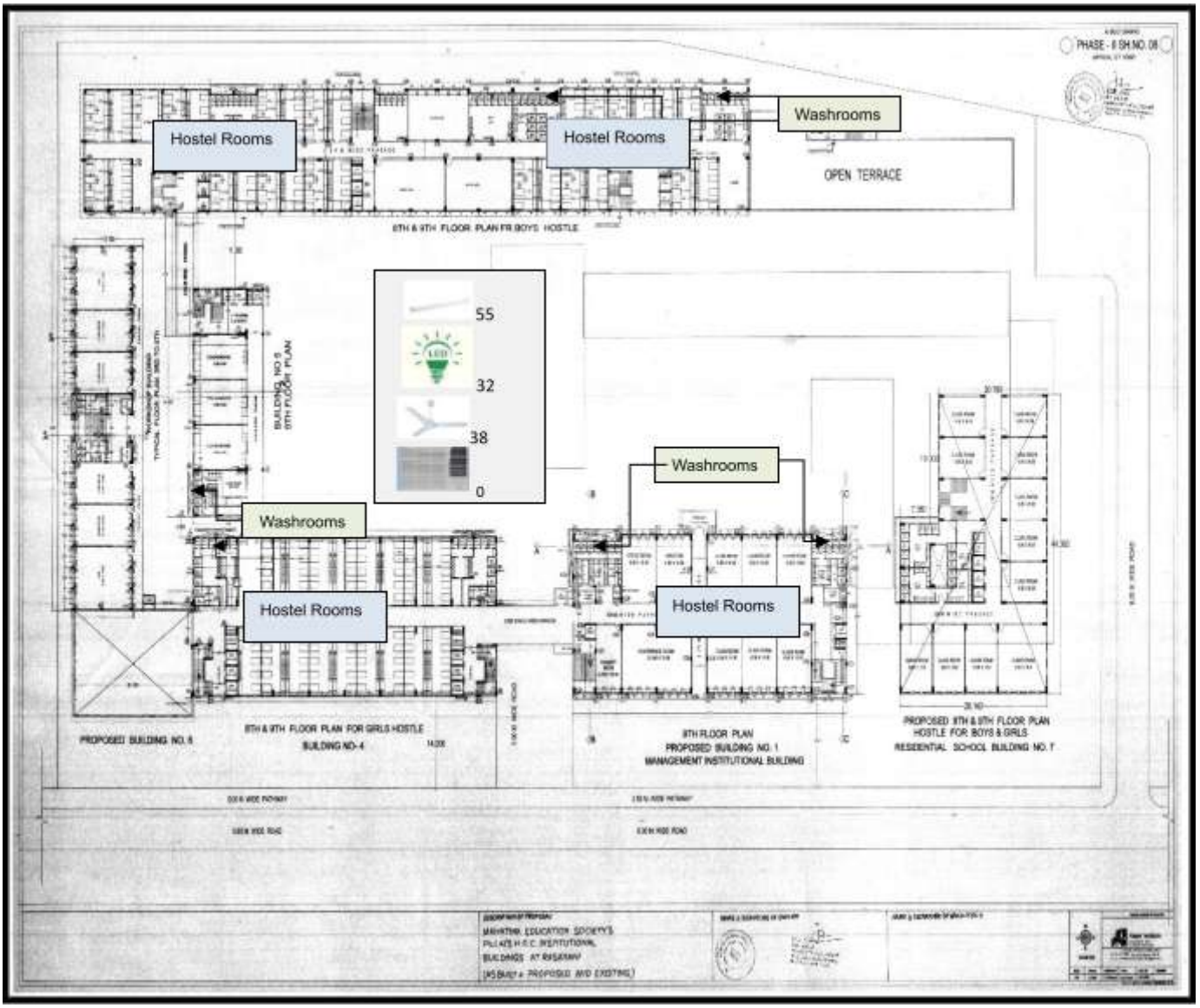
Sixth floor


Seminar Room
Storage Room
Electronics Labs
Washrooms
Chemistry
Classrooms
488
8
259
0
Washrooms
Classroom
Washrooms
Conference Room
PROPOSED BUILDING NO.8
TYPICAL FLOOR PLAN 6TH & 7TH BUILDING NO-4
6TH & 7TH FLOOR PLAN PROPOSED SCHOOL BUILDING NO.7

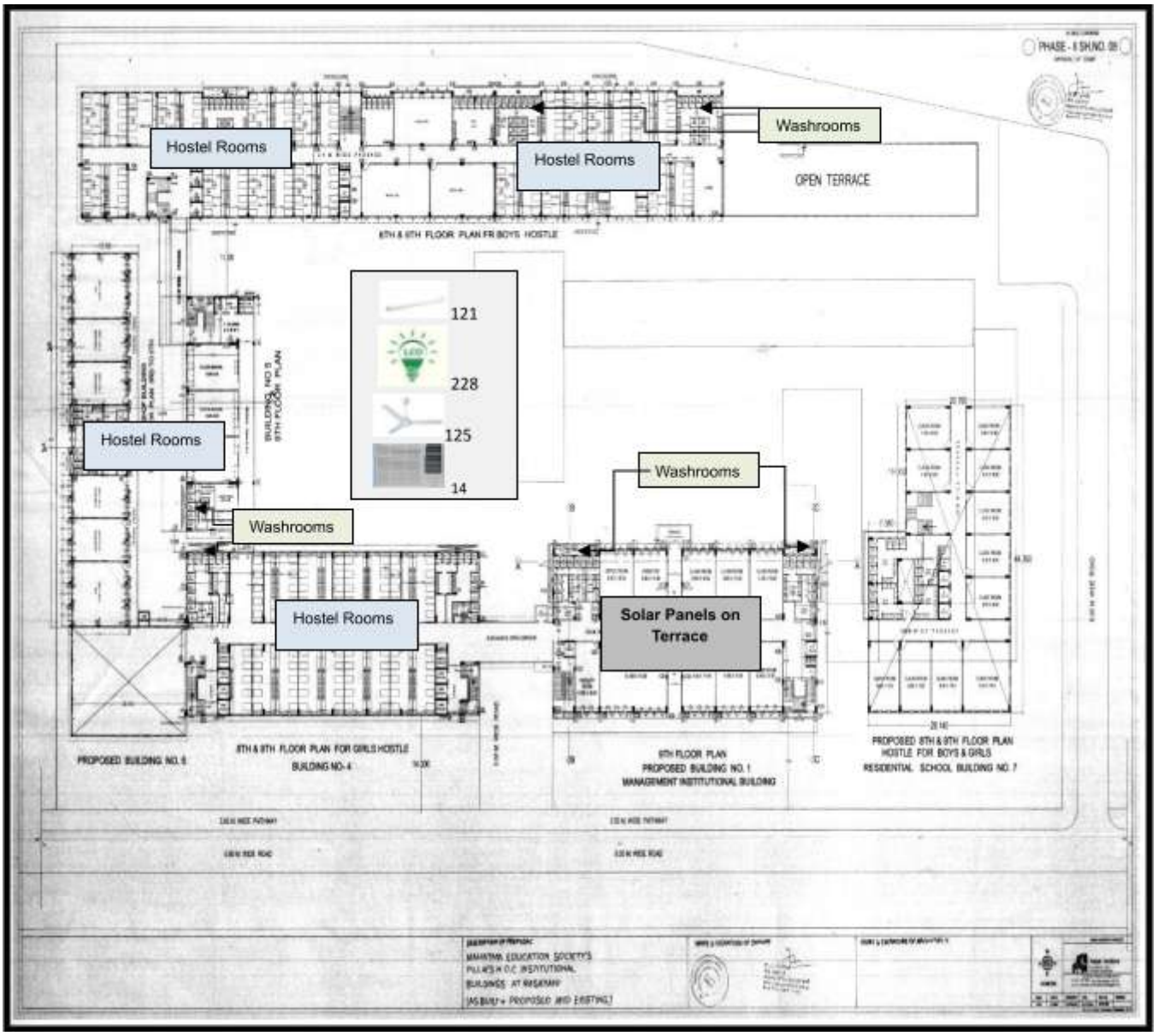
Seventh floor



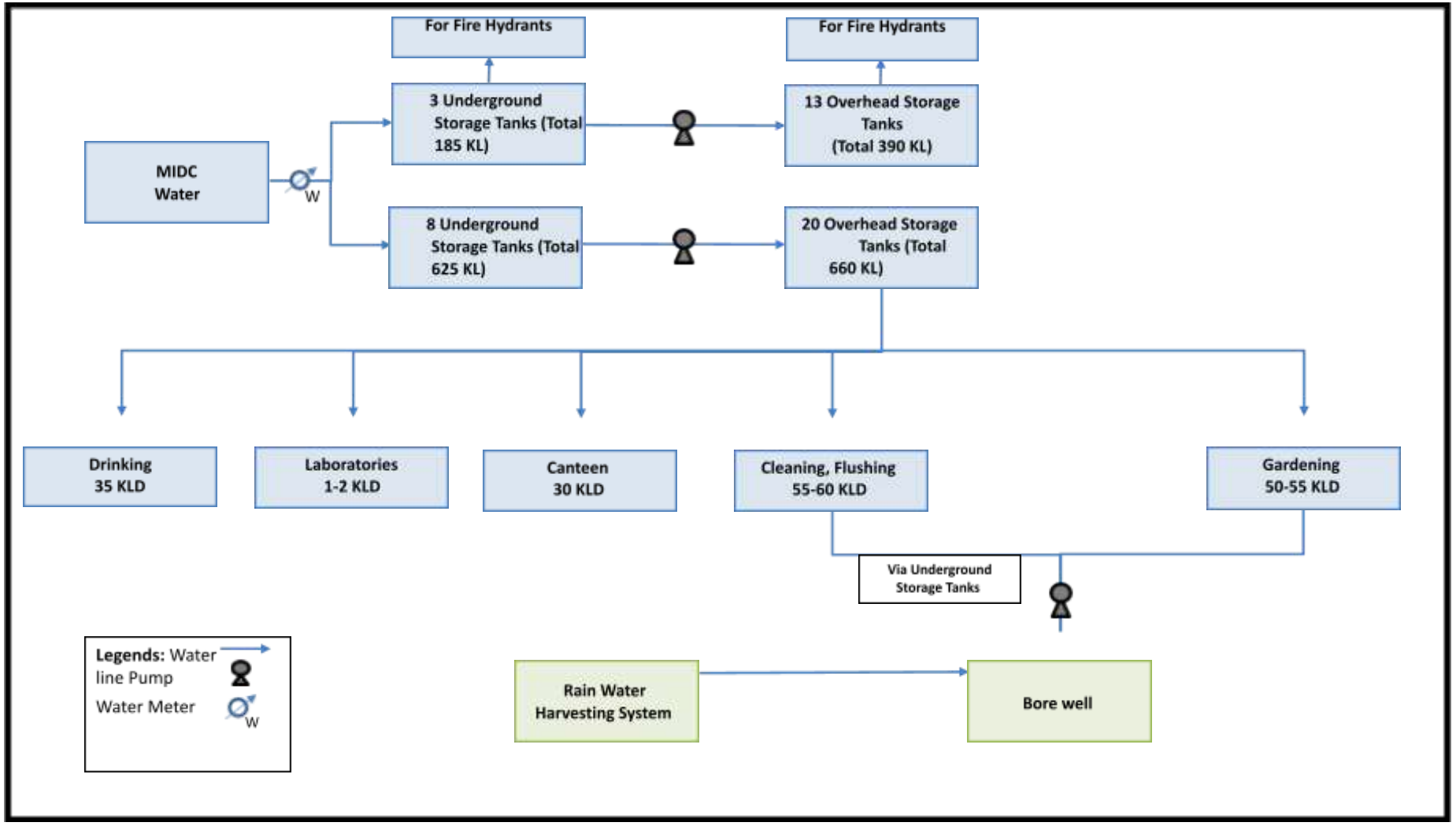
Eighth floor



Ninth floor


Hostel Rooms
Hostel Rooms
Washrooms
OPEN TERRACE
8TH & 9TH FLOOR PLAN FR BOYS HOSTLE
121
228
125
14
Hostel Rooms
Washrooms
Washrooms
Hostel Rooms
Solar Panels on Terrace
PROPOSED BUILDING NO. 6
8TH & 9TH FLOOR PLAN FOR GIRLS HOSTLE
BUILDING NO. 4
9TH FLOOR PLAN
PROPOSED BUILDING NO. 1
MANAGEMENT INSTITUTIONAL BUILDING
PROPOSED 8TH & 9TH FLOOR PLAN
HOSTLE FOR BOYS & GIRLS
RESIDENTIAL SCHOOL BUILDING NO. 7

Annexure 2: Water Distribution Diagram



Daily water usage is around 125 KL as per water bills which is approximately 21L /per person per day

Annexure 3: Indoor Gardening Details

Indoor plants are commonly used for their aesthetics benefits and they also have vital role reducing airborne pollution. The right choice of plants can be an excellent way of improving indoor air quality and general health. Local landscape contractor can be contacted for supply and rotation of these plants.

Plants	VOC it removes	Indoor source of VOC's	Plant care
 **Aloe Vera**	Formaldehyde, Trichloroethylene and Benzene	Chemical based cleaners and paints	Easy to grow with enough sunlight
 **Bamboo Plant**	Formaldehyde, Trichloroethylene and Benzene	Paints, Plastics, Wood products etc.	Thrives under low light conditions as well as easy to maintain
 **Chinese Evergreen**	Benzene	Paints	Low maintenance plant that prefers low light conditions.
 **English Ivy**	Formaldehyde, Benzene, Air borne faecal matter particles	Wood, Paper products, Air borne faecal – matter particles from pests	Easy to maintain

 **Janet Craig**	Formaldehyde, Benzene and Trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
 **Golden Pothos or Devils Ivy**	Formaldehyde, Cleanses air	Exhaust fumes, carpeting materials, panelling and furniture products made with particle board	Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.
 **Mass Cane**	Formaldehyde, benzene and trichloroethylene	Paints, Plastics, Wood products etc.	Medium to low light tolerant plant. Requires little water for growth.
 **Snake plant**	Formaldehyde and trichloroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.

 **Peace Lily**	Formaldehyde, benzene and trichloroethylene	Paints, Plastics, Wood products etc.	Relatively easy to maintain. Survives in low light conditions.
 **Red-edged Dracaena**	Formaldehyde and trichloroethylene	cooking fuels, wood products, facial tissues, personal care products and waxed papers	Drought resistant and Tolerates a variety of light conditions. Hard to damage or kill.
 **Spider Plant**	Formaldehyde, benzene, carbon monoxide and xylene	cooking fuels, wood products, Printing	Easy to maintain under medium to bright light condition.
 **Parlor Palm**	Purifies indoor air	-	Easy to maintain

Annexure 4: Green Audit Checklist

Good Daylight Design

Sr. No.	Design Feature		Remarks (if any)
1	Broad door opening	✓	
2	Clerestory/ High windows	✓	
3	Openings at the eastern and southern side	✓	To maximize sun use openings should at eastern and southern side
4	Rectangular building so that sunlight can reach all areas	✓	
5	Sunshade	x	
6	Double or triple glazing on windows	x	This will reduce the outside noise.
7	Enough illumination	✓	
8	Light colored fabric curtain or blind for window covering	✓	
9	Operable/ openable windows	✓	
10	Ultraviolet (UV) filtering windows	✓	Black Tinted windows can reduce the UV rays.
11	Use of exterior louvers to control glare	x	
12	Use of glass as facilitator of natural light	✓	
13	Use of insulated and tinted glass to filter heat gain	✓	

Ventilation

Sr. No.	Design Feature		Remarks (if any)
1	Downdraft cooling system (a downward flow of air)	x	
2	Ceiling height	✓	Height - 3.6 meters, Ground floor - 4.2 meters
3	Self-movement ventilators in the roof	x	
4	Wide corridors	✓	
5	Operable windows	✓	
6	Use of exhaust fans	✓	Exhaust fans are provided only in canteen and laboratories. Exhaust fans may be provided in washrooms.

Temperature and Acoustic Control

Sr. No.	Design Feature		Remarks
1	Earth air tunnel (cools air in summer and heat it in winter)	-	
2	Roof design & type (Double/ Mud/ Tiled/ Asbestos etc.)	-	
3	Sand stone cladding outside the walls	✓	

4	Special walls for temperature control (Thick/Double/cavity/fire/composite /green)		They have provided tiles on exterior which helps in temperature control.
5	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)		

6	Use of insulation material (e.g. autoclaved aerated blocks, hollow blocks, Thermocrete or higher R-value material)	x	
7	Use of water bodies/fountain		
8	Climbing creepers fitted to window in summer	x	
9	Lime coating for cool roof	-	
10	Retrofitting the existing roofs with cool roof technology	-	
11	White wash on the roof		
12	Use of landscaping as sound barrier		Trees and shrubs planted in the Campus.

Water Efficiency & Wastewater Management

Sr. No.	Measures		Remarks (if any)
1	Aerators to water taps		Aerator taps were observed only in ground floor staff washroom.
2	Automatic toilet faucets	x	
3	Drip irrigation (for plant watering system)		
4	Dual flush toilet with cistern	x	Dual flush is important for reducing water footprint.
5	Efficient plumbing system		Maintenance Department is Available.
6	Sewage treatment plant for sewage recycle	x	Campus is connected directly to MIDC.
7	Rainwater harvesting		
8	Regular maintenance for leakage free plumbing system		In-house Plumber is present.
9	Use of low flow/flow control water equipment or gadget	x	
10	Water free urinals (No flush urinals/Zero flush urinals/Water less urinals/air based flushing system these save water used in toilet)	x	

Energy Efficiency and On-site Energy Generation Mechanism

Sr. No.	Measures		Remarks (if any)
1	Avoid excessive lighting	x	Multiple lights are present on ground floor corridor for aesthetic purpose.
2	Computerized monitoring of electrical system	x	
3	Integrated energy saving design for natural cooling/heating		Building exterior walls are of tiles.
4	On-site energy generation		Diesel Generators, solar power generation are available.
5	Photocell occupancy sensor for automatic light control	x	
6	Regular maintenance of electrical system		
7	Use of day lighting system		

8	Use of energy efficient equipment	x	1 and 3-star ACs are presents. Refrigerators are without any ratings. Campus has limited LEDs.

9	Use of energy saving bulbs (Compact florescent light/LED lights)		34% of the total lights are LED.
10	Solar panel		Solar energy is used for Street lights.

Waste Management

Sr. No.	Measures		Remarks (if any)
1	Sale of books to its user for minimal charges		Send books and used papers to recycling organization.
2	Printing on both sides of paper		
3	Reuse of printed paper/ envelops		
4	Segregation of dry and wet waste	x	
5	Setting up recycling area/ composting area		
6	Creation of specified junctions for collection of E-waste(E-waste)	-	
7	Donation of computers to NGO's to refurbish and give it to needy people		
8	Hand over to organization or recycler who knows proper disposal system		Paper waste is handed to recycler. E-waste is given to the dealer based on buy-back policy.
9	Implementation of any recycling project or program	-	
10	Purchase of electronic products from company's which have after sales service for the disposal of product with buyback policy		
11	Installation of bins to collect garbage		
12	Outsourcing recycling of garbage to agency		
13	Recreating in to new sustainable products	x	
14	Use of colored bins with code to collect garbage		Colored bins are present only in canteens and not in classrooms or corridors.

Environmental Audit

Sr. No.	Type of audit		Remarks
1	Energy audit (includes energy consumption, thermal comfort, visual comfort)		Campus has carried out energy audit in May 2019 and energy audit report is received. Campus should comply with the recommendations given.
2	Sound/ Noise audit (includes indoor noise level, outdoor noise level)	x	
3	Water and waste audit (includes water quality, solid waste generation, solid waste disposal process)	x	

Universal Access and Efficient Operation and Maintenance of Building

Sr. No.	Design feature		Remarks
1	Easy access to the main entrance of the building	✓	
2	Elevator	✓	Accessible for all
3	Preferred car park spaces for specially abled	✓	
4	Ramp/ stairs with handrails on at least one side	✓	Some of the stairs do not have handrails. Handrails to be installed on all staircases.
5	Restrooms (toilets) in common areas	✓	
6	Uniformity in floor level	✓	
7	Audio guidance for specially abled	x	
8	Availability of wheel chair	✓	
9	Braille assistance for specially abled	x	
10	Personalized services by staff for differently abled	✓	
11	Visual warning signage in common and exterior areas	✓	
12	Follow standard procedures for commissioning of electrical/plumbing system	✓	
13	Purchase of standardized and quality material for repair	✓	
14	Regular maintenance of building	✓	In-house maintenance Department is present.
15	Use of chemical free products for cleaning	x	
16	User awareness program to minimize damage of property	✓	

Green Program

Sr. No.	Green program		Remarks
1	Buying recycled material	✓	
2	Creation of “Green Team” in the institution/library	x	
3	Campus conduct program by library science/Any other department e.g. “Eco-Friendliness: Changing our communities’ one step at a time.”	✓	
4	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	✓	
5	Providing external membership to small and local libraries (MOU with other colleges, -internal collegiate library loan)	x	
6	Recycling beyond books i.e. paper, aluminum, plastic, e-waste	✓	E - waste is used for Component lab and students’ projects.
7	Reduce, Reuse and recycle of the products (At the time of disposal of library material)	✓	
8	Availability of books/ magazines and online resource guide related to sustainability & Green Practices (energy/water conservation)	✓	

9	Contribute library information on sustainability resources to Campus publication, blog or website		Promote eco-friendly activities, post information related to sustainability, energy conservation, etc.

10	E Publishing reviews of new green resources in the newsletter or news	P	
11	Digitization		
12	E-archiving		
13	E-resources : E books, Online Journals, membership of consortium		

 : Provided P: Planned - : Not Applicable x: Not Provided

REPORT OF ENVIRONMENTAL / GREEN AUDIT OF PHCASC 2017-18

Mahalma Education Society's
PILLAI HOC COLLEGE OF ARTS, SCIENCE & COMMERCE

PHCASC

Pillai HOCL Educational Campus,Rasayani

1. Purpose of Green Audit in PHCASC Campus

The purpose of the audit was to ensure that the practices followed in the campus are Eco-friendly. With this in mind, the specific objectives of the audit were to evaluate the adequacy of the management control framework of Environment Sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards.

During the initial planning of the audit, an analysis was conducted in order to identify, evaluate and prioritize the risks associated with the environmental sustainability. The analysis was based upon an examination of the policies, manuals and standards that govern the environmental sustainability, on data analysis, and on the results of preliminary interviews with personnel considered key in the environmental management in the campus. The criteria and methods used in the audit were based on the identified risks.

The methodology used included physical inspection of the campus, review of the relevant documentation, and interviews.

2. Objectives of the Study

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

The main objectives of carrying out Green Audit are:

1. To introduce and aware students to real concerns of environment and its sustainability
2. To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
3. To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
4. To bring out a status report on environmental compliance

3. Methodology

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarise the present status of environment management in the campus:

- ❖ Water management
- ❖ Energy Conservation
- ❖ Waste management
- ❖ E-waste management
- ❖ Green area management

4. Observations and Recommendations

4.1. Water Use

This indicator addresses water consumption, water sources, irrigation, storm water, appliances and fixtures. A water audit is an on-site survey and assessment to determine the water use and hence improving the efficiency of its use.

a) Observations

Source	The study observed that Well and Ponds are the two major sources of water
Use	Drinking purpose, canteen, toilets, laboratory and gardening. During the survey, no loss of water is observed, neither by any leakages, nor by over flow of water from overhead tanks

One rain water harvesting units are also functional for recharging bore well. Gardens are watered by using drip/sprinkler irrigation system to save water. This is one of the unique steps towards greening practices.

Sprinkler

Drip water irrigation

Auto close tap

b) Recommendations

Need of monitoring, controlling overflow is essential and periodically supervision drills should be arranged. In campus small scale/medium scale/ large scale reuse and recycle of water system is necessary.

4.2. Energy Use and Conservation

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

a) Observations

Energy source utilized by all the departments and common facility centre is electricity only. Total energy consumption is determined as 23308 KWH/Year by major energy consuming equipments. All the departments and common facility centres are equipped with CFL lamps. Approximately 90 CFLs (Capacity) are counted during survey. Equipments like Computers are used with power saving mode.

The PCs monitors are changed from CRT monitors to LED monitors which is less power consuming.

Also, campus administration runs switch –off drill on regular basis.

conservation.

b) Recommendations

Installation of LED lamps.

In science department like Physics, Chemistry, Mathematics, Botany and Zoology electricity was shut downed after occupancy time is one of green practices for energy

4.3. Waste Generation

This indicator addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable, construction, glass, dust etc and recycling.

Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair, and reuse. Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. The survey focused on volume, type and current management practice of solid waste generated in the campus.

The different solid wastes collected as mentioned above.

a) Observations

The total solid waste collected in the campus is 21 Kg/day approx . Waste generation from tree droppings and lawn management is a major solid waste generated in the campus. The waste is segregated at source by providing separate dustbins for Bio-degradable and Plastic waste. Segregation of chemical waste generated in chemistry and zoology laboratories is also practiced. Single sided used papers reused for writing and printing in all departments. Important and confidential reports/ papers are sent for pulping and recycling after completion of their preservation period. Very less plastic waste (0.1Kg/day) is generated by some departments, office, garden etc but it is neither categorized at point source nor sent for recycling. Metal waste and wooden waste is stored and given to authorized scrap agents for further processing. Few glass bottles are reused in the laboratories. The food waste from main canteen and mess is used or sent for composting.

Composting Project

The institute has adopted composting near the cafeteria in a designated place and the dustbins have been renamed as Wet Garbage, Dry Garbage and Waste food. The main purpose of this is to reduce disposable waste in the college campus. After complete process of composting, it is used as manure in the garden, lawns and landscaping.

b) Recommendations

- Reduce the absolute amount of waste that it produces from college staff offices.
- Make full use of all recycling facilities provided by City Municipality and private suppliers, including glass, cans, white, coloured and brown paper, plastic bottles, batteries, print cartridges, cardboard and furniture.
- Provide sufficient, accessible and well-publicized collection points for recyclable waste, with responsibility for recycling clearly allocated.
- Single sided papers to be used for writing and photocopy
- Important and confidential papers after their validity to be sent for pulping.

c) Solid Waste Management as a Part of Green Audit

YES One of the effort taken by our institution as a part of green audit is the solid waste management initiative. Students participated with great numbers with enthusiasm. This was also called as **ZERO GARBAGE INITIATIVE**.

4.4. E-Waste Generation

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. This makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

a) Observations

E-waste generated in the campus is very less in quantity. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E- waste and defective item from computer laboratory is being stored properly. The institution has decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.

b) Recommendations

- Recycle or safely dispose of white goods, computers and electrical appliances.
- Use reusable resources and containers and avoid unnecessary packaging where possible.
- Always purchase recycled resources where these are both suitable and available.

4.5. Green Area

This includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards. This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

a) Observations.

Campus is located in the vicinity of approximately 80 types (species) trees. Various tree plantation programs are being organized during the month of July and August at college campus and surrounding villages through NSS unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among local people.

b) Recommendations

- Reviews periodically the list of trees planted in the garden, allot numbers to the trees and keep records. Give scientific names to the trees.
- Promote environmental awareness as a part of course work in various curricular areas, independent research projects, and community service.
- Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.
- Establish a College Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy.
- Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings.
- Celebrate every year 5th June as ‘Environment Day’ and plant trees on this day to make the campus more Green.

Following steps were undertaken this year 2017-18

To maintain eco-friendly ambience a following steps are followed –

1. Green building for quality living.

2. Know green and think green is promoted on the campus by NSS and Nature Club in the institution.

Mr Rahim Shekh is guiding to students at the Park.

3. Water conservation and prevention of water wastage.

4. Use of CFL bulbs instead florescent bulbs. All CRT Monitors in the campus have been replaced by LCD monitors and use of slim tube lights.

5. **Composting** : of waste has been started in campus. The activity was inaugurated by Mr. Ganesh Kadu

6. We have two big **KOEL Eco-friendly** generators which cater to power needs of the entire campus instead of having different generators for each building with that saving diesel fuel.

7. Cigarettes and tobacco are strictly banned in the campus making it a drug free and smoke free campus. (Till now no such incident have been reported)

8. Efforts for Carbon dioxide neutrality are maintained on the campus by developing greenery, landscaping, parking for students and staff.

9. Turning off PC monitors and other electrical appliances after work.

10. Global warming, biodiversity and pollution incorporated in the curriculum (National Conference on Environmental, Economic and Political Aspects of Climate Change to be held on 8th September 2017)

Additional/Miscellaneous Initiatives taken in A.Y 2017-18

a. Water management: Within the campus, the maintenance team checks for dripping taps and leakages which are promptly attended by plumbers. A rain water harvesting system is in place where in the rainwater from the terrace and ground recharges the bore well.

from plastic carry bags and this should be put into practice strictly. However, more departments are now following green charter and started avoiding flex banners and plastic carry bags and cups for social functions and academic programmes.

c. Landscape: The campus has been made green by landscaping around the campus which is been maintained by the gardeners and monitored regularly.

d. Transportation: Majority of the students in the campus rely on buses provided by the institution, and state run public transport buses indicating lesser carbon foot print of the student community.
The bus transportation covers many areas like Panvel Khopoli ,Karjat, Pen,Uran Alibaug etc.

f. Green Agenda in Syllabus: Green agenda form part of the curriculum (see table below) in many departments and eco/nature clubs remain active (see below photo) for the cause of environmental protection, though it is not a common practice in all the departments/courses in the campus.
For ex: in BMS 2nd year there is a compulsory core subject of Environment Management.

Environment Management in Curriculum for extension and awareness

Details of survey was conducted are as per the table below.

Sr. No	Particulars	YES OR NO	Remarks
1	Green Landscape	Area	Beautiful Green Landscape covers the entire campus
2	Transportation	YES	Available for both staff and students which reduces the carbon foot prints
3	Dustbins	14 no.	Enough Dustbins are there throughout the campus to avoid littering
4	Generator	YES	KOEL Eco Gensets for power backup
5	E-waste management	YES	Electronics goods are put to optimum use. A separate room is provided to store E-waste.
6	Environment Cell and Nature club	YES	We promote awareness regarding environment to students via club and committees like NSS, Nature club.

7	**Number of Trees**	**90 Different types**	**Different species of trees are there near vicinity of the campus.**
8	**Composting (Solid waste management)**	**YES**	**Composting box and dust bins of wet and dry are placed near the cafeteria.**
9	**Drip Irrigation**	**YES**	**More than 1 km area.**
10	**Sprinklers**	**YES**	**Sprinklers are used at designated place.**

Conclusions

Considering the fact that the institution is predominantly an undergraduate college, there is significant environmental research both by faculty and students. The environmental awareness initiatives are substantial. The installation of solar panels, paperless work system and composting practices are noteworthy. Besides, environmental awareness programmes initiated by the administration shows how the campus is going green. Few recommendations are added to curb the menace of waste management using ecofriendly and scientific techniques. This may lead to the prosperous future in context of Green Campus & thus

sustainable environment and community development.

As part of green audit of campus, we carried out the environmental monitoring of campus includes Illumination, Noise level, Ventilation and Indoor Air quality of the class room. It was observed that Illumination and Ventilation is adequate considering natural light and air velocity present. Noise level in the campus well within the limit i.e. below 50 dB at day time.

Mahatma Education Society's
Pillai HOC College of Arts, Science & Commerce, Rasayani
(NAAC Accredited & ISO 9001:2015 Certified)

ACTION TAKEN AND ACHIEVEMENT REPORT FOR CLEAR AND GREEN CAMPUS

The Plan of action chalked out by the institution towards a clean & green campus is as follows:

Sr. No	Initiatives/Agenda	Outcomes/Achievements
1.	Green Audit	College completed all the processes involved toward the Green audit.
2.	Energy Audit	College completed all the processes involved toward Energy audit.
3.	Electrical Safety Audit	College completed all the processes involved toward the Electrical Safety audit.
4.	Preparation of compost from canteen waste	Initiated the preparation for compost from the accumulated canteen waste and further used it as a fertilizer for campus greenery.
5.	E-Waste Cell (E-waste drive)	E-waste was collected from the students and staff members. The students used the E-waste and plastic materials to make benches. Plastic waste with concrete, sand and cement was used in some proportion to build the benches.
6.	Pollution Control Day	Poster making competition was organized by Nature Club.
7.	Preservation of Ozone Layer Day	Slogan writing Competition was conducted for students by the Nature Club.
9.	Minimal Plastic Usage Drive	Students and staff members are made aware of minimal plastic usage through sign boards and regular notices circulated in the campus. During orientation programmes, students are informed of minimal plastic usage as well.
10.	Restricted Entry of Automobiles	College allows restricted entry of automobiles to reduce air pollution.

11.	Plastic bottle crushing machine	Plastic bottle crushing machine is installed on the college campus. Furthermore, the crushed bottles are used by students for various initiatives.
12.	Tree Plantation Drive	The institution conducts Tree Plantation Drives every year.
13.	Celebration of Nature Conservation Day	Online quiz was conducted by the Institutional Social Responsibility Cell (ISR).
14.	World Habitat Day	Shelter making competition was conducted. Students made shelters out of waste for birds.
16.	Minimal Paper Usage	Students and all staff members are encouraged to use digital mode of communication to reduce the use of paper.
17.	Clean and Green Campus Initiatives	Appreciation/awards for a Clean and Green Campus were received from the Range Forest Officer, Khalapur and other government organizations.
18.	Celebration of World Environmental Day	Successfully organized a 'slogan writing' competition to make students aware of environment friendly practices.

Principal
Pillai HOC College of Arts, Science and Commerce,
Rasayani

Principal
Mahatma Education Society's
Pillai's HOC College of Arts
Science and Commerce
HOC Educational Campus,
Rasayani, Tal. Khalapur,
Dist. Raigad. PIN - 410 207

SHRI SIDDHIVINAYAK SOCIAL SANSTHA

(SUMAN SADAN, PODI NO. 1, SEC.-16, NEW PANVEL - 410206)

REG. NO. 74/2001-RAIGAD

Date :

MEMORANDUM OF UNDERSTANDING

This Memorandum of Association has been made and executed at Raigad district, Maharashtra, on the 5th day of April, year 2017

BETWEEN

Shree Siddhivinayak Social Sanstha, a registered NGO, with its office at Raigad, through its Secretary/Chief Consultant Mr. Ganesh Kadu, under file no. Raigad/74/2001 (hereinafter called the party of the First Part or the First Party);

AND

Pillai HOC College of Arts, Science and Commerce, Rasayani, Maharashtra, affiliated to University of Mumbai, approved initially at 2008, having its campus at Rasayani, Raigad, through the Principal of the Institute (hereinafter called the Party of the Second Part or the Second Party).

WHEREAS the first party is an NGO registered as Shree Siddhivinayak Social Sanstha. It is a non-profit organization has introduced 'Zero Garbage' venture which is an extension of the initiative taken up by the Ex Municipal Councillor of Panvel, Mr. Ganesh Kadu, invoving educational institutions. It was established on _____, 2001, by Mr. Ganesh Kadu, the founder and Secretary. As a part of this campaign, the students provided specially designed baskets with cultures wherein the wet waste produced in kitchens can be added and be gradually transformed to manure. They demonstrated the techniques involved and the fundamentals to be taken care of in creating odourless and rich manure. As the first step towards extending a helping hand for the cause, they explained the importance and necessity of segregation of wastes and how the waste produced from every household can be converted to organic manure.

AND WHEREAS, the party of the second half has been established under educational institution under University of Mumbai, to provide for education and research in various branches of Sciences and Arts thereby, disseminate knowledge.

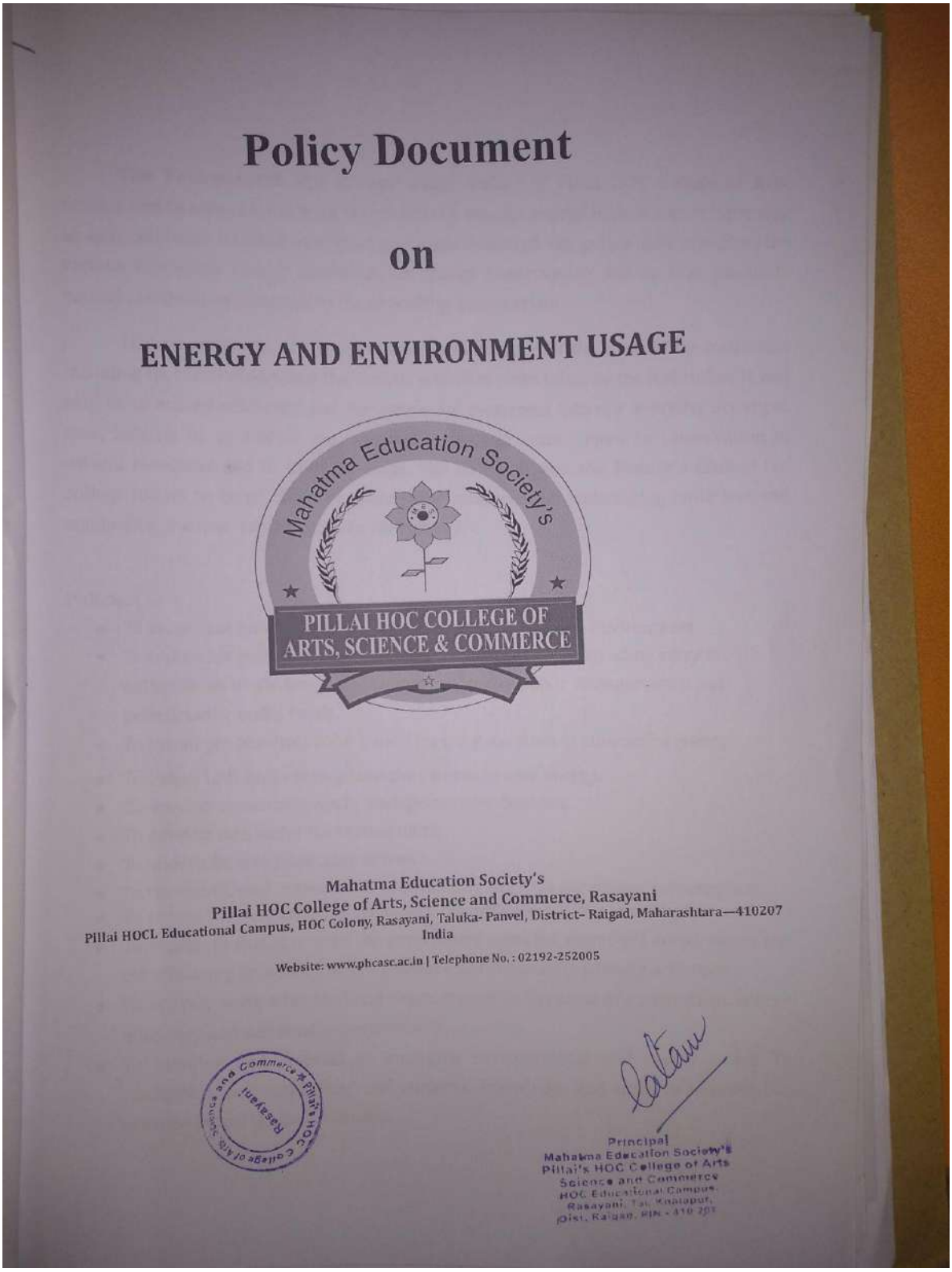
PRESIDENT	VICE - PRESIDENT	SECRETARY	TRESARER	VICE - TRESARER
GANESH KADU	SANDEEP GHODEKAR	RAJESH KHANDVI	SANJAY PUJARI	PRASHANT KADU

MEMBERS

RAJESH DUDHMAL ROHAN LOKHANDE BALA INGALE SUSHANT GAMARE RUSHI DAREKAR

2021-22

Policy Documents on Environment and Energy Usage



Policy Document

on

ENERGY AND ENVIRONMENT USAGE

Mahatma Education Society's

PILLAI HOC COLLEGE OF ARTS, SCIENCE & COMMERCE

Mahatma Education Society's
Pillai HOC College of Arts, Science and Commerce, Rasayani
Pillai HOCL Educational Campus, HOC Colony, Rasayani, Taluka- Panvel, District- Raigad, Maharashtara—410207
India

Website: www.phcasc.ac.in | Telephone No. : 02192-252005

Rasayani

Principal
Mahatma Education Society's
Pillai's HOC College of Arts
Science and Commerce
HOC Educational Campus,
Rasayani, Tal. Khalapur,
Dist. Raigad, PIN - 410 207

The Environment and Energy usage Policy of Pillai HOC College of Arts, Science and Commerce, Rasayani is to primarily manage energy in such a systematic way so as to minimize its negative impact on the environment. The policy aims to explore the various renewable energy resources for energy conservation and to find substitute natural resources as solutions to the prevailing energy crisis.

This environment and energy policy is binding to all the areas of the institution including 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 conservation of natural resources and to limit its usage. The **NSS unit and the Nature's Club** of the college intend to bring about environmental awareness by undertaking initiatives and conducting various programmes to save energy.

Policies:

- To assess our energy usage and measure its impact on the environment.
- To reduce air pollution emission within the campus by restricting entry of automobiles in the campus, increasing the use of public transportation and pedestrian-friendly roads.
- To install photovoltaic solar panels for the generation of alternative energy.
- To install LED bulbs throughout the campus to save energy.
- To develop systematic waste management mechanisms.
- To develop rain water harvesting units.
- To undertake tree plantation drives.
- To take additional measures to continuously improve our energy consumption.
- To ensure the availability of necessary resources to achieve our objectives.
- To engage in dialogue with the government agencies, municipal corporations and the affiliating university to bring about environmentally friendly activities.
- To 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' knowledge and skills to improve our actions toward the environment.

- To offer opportunities for employees and students to engage in initiatives that contribute to environmental protection.

This policy will be communicated to the students and employees through internal communication channels, and will be made available to all the stakeholders through the institutional website. The Environment and Energy Policies objectives and targets will be reviewed on a regular basis under the guidance of the Principal of the college.

Pillai's HOC College of Arts, Science and Commerce Rasayani

Principal
Mahatma Education Society's
Pillai's HOC College of Arts
Science and Commerce
HOC Educational Campus,
Rasayani, Tal. Khalapur,
Dist. Raigad, PIN - 410 207

Environmental Promotional Activities

World Environment Day

Name of the event:	**Slogan Writing Competition On World Environment Day.**
Conducted by:	**Department of Chemistry in association with Internal Quality Assurance Cell.**
Date:	**June 5 to June 8,2021**
Venue/ Online Platform:	**Online Google form**
Activity Falls under Criterion/Criteria:	Criterion 7
Convenor:	Dr. Sapana M Chilate
Co-Convenor (If Any):	Dr. Archana Bhagwat
Number of participants benefitted:	40
Report:	Department of Chemistry in association with the Internal Quality Assurance Cell of Pillai HOC College of Arts, Science and Commerce College, Rasayani had organized **an online slogan writing competition on World Environment Day from June 5 to June 8 ,2021** through online Google platform. Competition was conducted for students of all colleges, **40** students from various colleges participated in the competition. Result of competition was declared on June 16 on college website. E- Certificates have been issued to all participants. Best three slogans were selected based on Relevance , Creativity ,Uniqueness, Originality criteria.

Photos:	 
Winner (If Any):	First :Miss Varsha Patil Willingdon College Sangali Second: Mast.Sidhant Salunke KLE College, plot No.29Sector1 Kalamboli Navi Mumbai Third: Miss Jagruti Jadhav M.B More ASC Women's College Dhatav.

Poster Making Competition on National Pollution Control Day

Name of the event :-	**Poster Making Competition on National Pollution Control Day**
Conducted by:-	**Nature Club**
Date:-	**December 04, 2021 to December 10 , 2021**
Venue/ Online Platform:-	**Online Google Forms**
Activity Falls under Criterion/Criteria: -	**Criterion 7**
Convenor:-	**Ms.Neethumol K G**
Co-Convenor: - (if any)	**Dr.Vishakha T**
Number of participants benefitted:-	**05**
Report:-	Nature Club in association with IQAC, successfully organised Poster Making Competition to observe the National Pollution Control Day on December 04, 2021 to December 10, 2021. Total 05 participants are participated in this Competition. E-certificates have been issued to all those who are participated. The day is observed in the memory of those who have lost their lives in the Bhopal Gas tragedy on the night of December 2nd and 3rd, 1984.

Photos:-


Mahatma Education Society's
Pillai HOC College of Arts, Science and Commerce, Rasayani
(Accredited by NAAC)
Internal Quality Assurance Cell (IQAC)
In association with
Nature Club
organises
Poster Making Competition on
"National Pollution Control Day"
THEME: 'LIKE ANY OTHER YEAR"
The Link for the Registration and Poster submission: https://forms.gle/c7Xaaz4bXZ8GRRBR6
STARTS ON: 4 December, 2021
ENDS ON: 10 December, 2021
Result Declaration on Website: 15 December, 2021


NATIONAL
POLLUTION CONTROL DAY
#BurnFatNotFuel

	 
Winners(if any):-	Top 3 students are follows: 1. Jyotirmay Chowdhury 2. Chaitali Vedpathak 3. Mansi Kushwaha

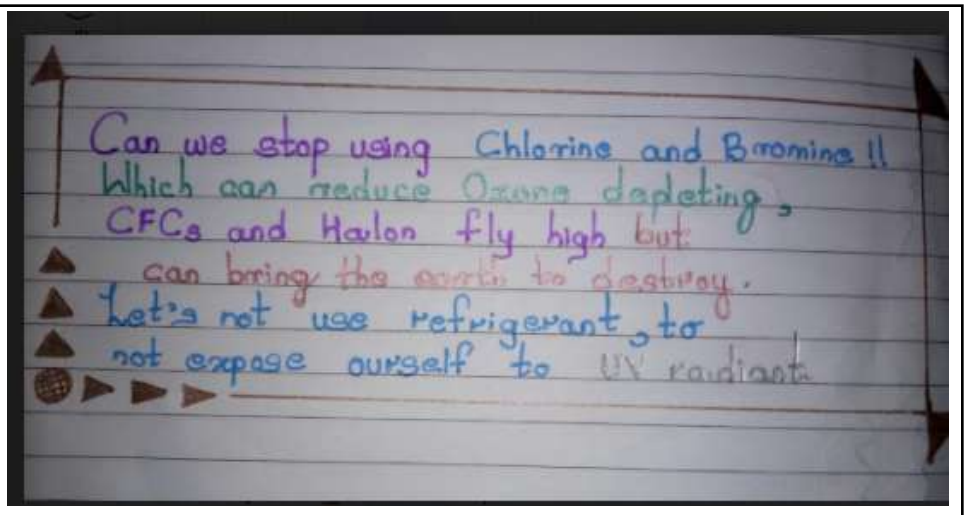
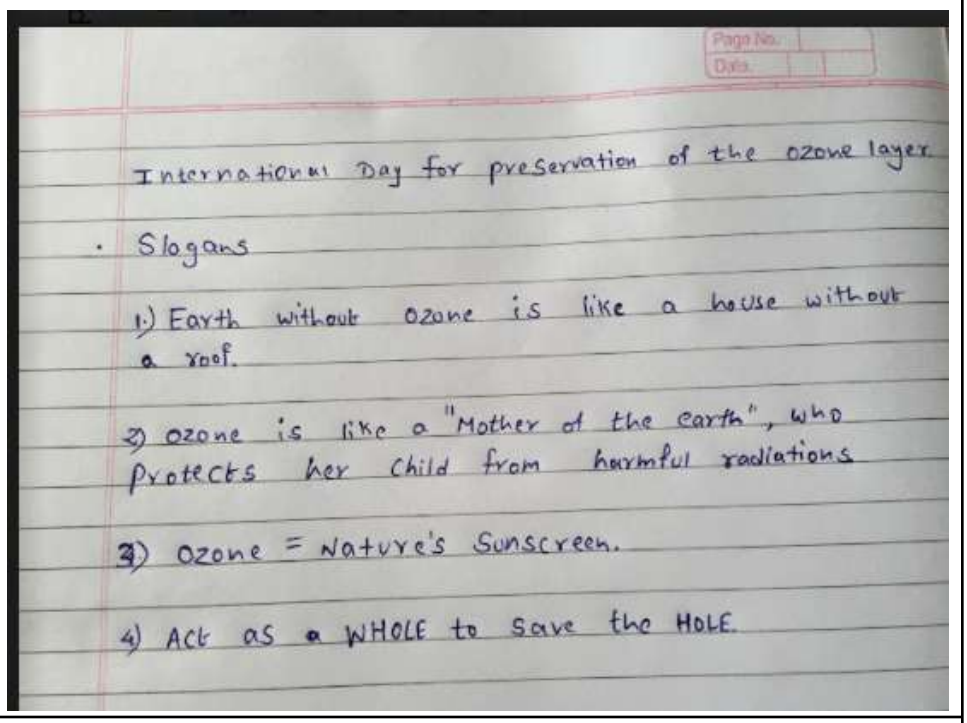
Slogan Writing Competition on International Day for the Preservation of the Ozone Layer

Name of the event :-	**Slogan Writing Competition on International Day for the Preservation of the Ozone Layer**
Conducted by:-	Nature Club
Date:-	September 16, 2021 to September 18, 2021
Venue/ Online Platform:-	Online Google Forms
Activity Falls under Criterion/Criteria: -	Criterion 7
Convenor:-	Ms.Neethumol K G
Co-Convenor: - (if any)	Mr. Priyesh Keekan
Number of participants benefitted:-	04
Report:-	Nature Club in association with IQAC, successfully organised Slogan Writing Competition on International Day for the Preservation of the Ozone Layer on September 16, 2021 to September 18, 2021. Total 04 participants are participated in this Competition. E-certificates have been issued to all those who are participated. The objective of this event is to observe International Day for the Preservation of the Ozone Layer (September 16).

Photos:-


MAHATMA EDUCATION SOCIETY'S
PILLAI HOC COLLEGE OF ARTS, SCIENCE AND COMMERCE,
RASAYANI
(ACCREDITED BY NAAC)
Internal Quality Assurance Cell
In association with
Nature Club
organises
Slogan Writing Competition on
International Day for the Preservation of the Ozone Layer
The Link for the Registration and slogan submission:
https://forms.gle/hCAbHWdCaeT5FSPQ
STARTS ON: 16 SEPTEMBER, 2021
ENDS ON: 18 SEPTEMBER, 2021
Date of Result declaration on website: September 25,2021

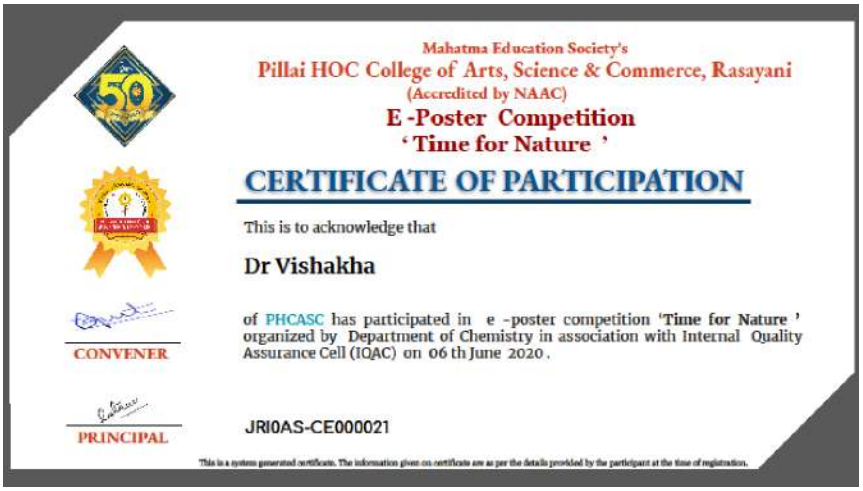

Mahatma Education Society's
Pillai HOC College of Arts, Science and Commerce, Rasayani
(Accredited by NAAC)
Certificate of Participation
{{Full Name}}
of [[Other identifier]] has participated in an Online "Slogan Writing Competition" jointly organized by Nature Club and Internal Quality Assurance Cell (IQAC) to observe International Day of Preservation of Ozone Layer on September 16, 2021.
Dr. Lata Menon
Principal
{{Certificate ID}}

	 
Winners(if any):-	Top 3 students are follows: 1. Roshni Santosh Singh-First 2. Prerna Gotiram Tupe- Second 3. Sahil Bisht- Third

Environmental Promotional Activities

Time for Nature

Name of the event :-	Time for Nature E –poster making competition
Conducted by:-	Department of Chemistry
Date:-	June 06 .2020 t0 June 08 ,2020
Venue/ Online Platform:-	Online
Activity Falls under Criterion/Criteria:-	Criterion 7
Convenor:-	Dr Archana B
Co-Convenor: - (if any)	Dr Vishakha B
Number of participants benefitted:-	24
Report:-	Department of Chemistry in collaboration with IQAC has organised e poster making competition on 06/06/2020 to celebrate World Environmental Day . The theme of competition was Time for Nature . There were total 24 posters were submitted . Participants from different states had submitted posters in the form of handmade posters , posters made through paint (PC). Best three posters were selected based on Relevance , Creativity , Uniqueness ,Originality criteria .

Photos:-	
Winners(if any):-	1. 1st - Jinal Prajapati SIES College of management studies 2. Rohan Yadav SSR college of Arts ,Science & Commerce 3 .Samridhha Banawal Pillai HOC School ,Rasayni -

SHELTER FOR BIRDS COMPETITION-2020

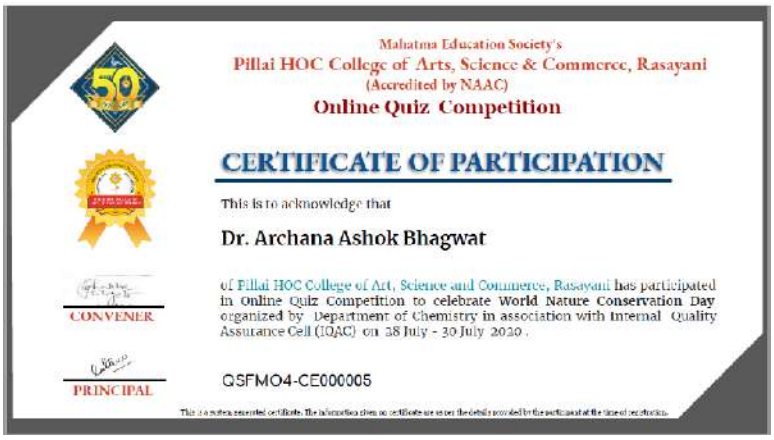
Name of the event :-	SHELTER FOR BIRDS COMPETITION-2020
Conducted by:-	NATURE CLUB IN ASSOCIATION WITH THE IQAC OF PILLAI HOC COLLEGE OF ARTS, SCIENCE & COMMERCE IN ASSOCIATION WITH IQAC OF PHCASC
Date:-	6th JULY, 2020
Venue/Online Platform	Google Link
Activity Falls under Criterion/Criteria:-	VII
Convenor	Ms. Ashvini Satve
Co - Convenor	Mr. Prathamesh Gokhale
Number of Participants	10
Report:-	**Mahatma Education Society's** **Pillai HOC College of Arts, Science and Commerce , Rasayani** ***REPORT ON SHELTER FOR BIRDS COMPETITION-2020 CONDUCTED BY NATURE CLUB IN ASSOCIATION WITH THE IQAC OF PILLAI HOC COLLEGE OF ARTS, SCIENCE & COMMERCE IN ASSOCIATION WITH IQAC OF PHCASC*** The following Report is based on ***SHELTER FOR BIRDS-2020*** activity conducted by the NATURE CLUB of Pillai HOC College of Arts, Science and Commerce on 6th July, 2020. The NATURE CLUB of Pillai HOC College of Arts, Science and Commerce led by an example for all to follow by taking an initiative to build homes for our little friends (Birds). This competition aimed at inculcating a feeling of belongingness towards the nature and thereby gave hands to the thirsty and hungry

Name of the event :-	SHELTER FOR BIRDS COMPETITION-2020
Conducted by:-	NATURE CLUB IN ASSOCIATION WITH THE IQAC OF PILLAI HOC COLLEGE OF ARTS, SCIENCE & COMMERCE IN ASSOCIATION WITH IQAC OF PHCASC
Date:-	6th JULY, 2020
	birds by welcoming them to the shelters prepared by the enthusiastic students of the college itself. Led by the charismatic and enthusiastic leaders from the front like Ms Ashwini Satve (Convener) and Mr. Prathamesh Ghokle (Co-Convener) of Nature Club, there was overwhelming response of about 150 students and 07 of the best candidates were honored with the Certificate of Appreciation. The Helping hands were also provided other members of the Club which included the likes of Mrs. Pallavi Patil, Mr.Ravi Bari & Mr. Keekan Priyesh Raghavan. It was indeed a successful venture and such activities do help in embracing nature with open hands. Thus, Nature Club added yet another success story to its ever increasing pages of philanthropic activities.
Photos:-	  
Banner:-	

Name of the event :-	SHELTER FOR BIRDS COMPETITION-2020
Conducted by:-	NATURE CLUB IN ASSOCIATION WITH THE IQAC OF PILLAI HOC COLLEGE OF ARTS, SCIENCE & COMMERCE IN ASSOCIATION WITH IQAC OF PHCASC
Date:-	6th JULY, 2020

World Nature Conservation Day 2020

Name of the event :-	**An online quiz on World Nature Conservation Day 2020**
Conducted by:-	**Department of Chemistry**
Date:-	**28/07/2020-30/07/2020**
Venue:-	**Online Google form**
Activity Falls under Criterion/Criteria:-	**Criterion VII**
Convenor:-	**Dr. Vishakha Telgote**
Co-Convenor:-	**Dr. Archana Bhagwat**
No. of participants	**180**
Report:-	To mark golden jubilee of Mahatma Education Society, Department of chemistry of Pillai HOC College of Arts, Science and Commerce College, Rasayani had organized **an online quiz competition on World Nature Conservation Day 2020** on **28/07/2020-30/07/2020** through online Google form. Test was conducted for students and faculties of all colleges. Google form included total 15 questions with two mark each. **180** students and faculties from various colleges participated in the quiz. E- Certificates have been issued to all those who secured 50% marks. Out of 180 participants, 168 participants qualified the quiz.

Photos:-	Sample certificate  Mahatma Education Society's Pillai HOC College of Arts, Science & Commerce, Rasayani (Accredited by NAAC) Online Quiz Competition CERTIFICATE OF PARTICIPATION This is to acknowledge that Dr. Archana Ashok Bhagwat of Pillai HOC College of Art, Science and Commerce, Rasayani has participated in Online Quiz Competition to celebrate World Nature Conservation Day organized by Department of Chemistry in association with Internal Quality Assurance Cell (IQAC) on 28 July - 30 July 2020 . CONVENER PRINCIPAL QSFMO4-CE000005

Pictureque 2021-Online Photography Competition

Name of the event :-	Pictureque 2021-Online Photography Competition
Conducted by:-	Department of Chemistry in association with IQAC
Date:-	March 22,2021 TO March26,2021
Venue/ Online Platform:-	Online
Activity Falls under Criterion/Criteria:-	Criteria VII
Convenor:-	Dr .Vishakha T
Co-Convenor: - (if any)	Dr. Archana Bhagwat
Number of participants benefitted:-	07
Report:-	Department of Chemistry in association with IQAC had organized – Picturesque2021 -Online photography Competition to celebrate World Water Day and to raise awareness of 2.2billion people living without access to safe water. The theme of the Competition was Valuing Water . Students from various colleges had participated in competition .
Winners	1- Araya Bhagat(First year Diploma , Pillai HOC Polytechnic college, Rasayni)

	2- Harshad Babar(FYBSc- CS,N R Swamy College of Commerce & Economics & Thirumalai College of Science ,Wadala)

Environmental Promotional Activities

Environmental Concerns and Eco-friendly Measures

Name of the event	Exhibition Competition on **'Environmental Concerns and Eco-friendly Measures'**
Conducted by:-	IQAC
Date:-	July 05, 2019
Venue:-	7th floor classrooms
Report:-	Pillai HOC College of Arts, Science & Commerce and IQAC (Internal Quality Assurance Cell) as a part of ISR (Institutional Social Responsibility) of our college organised an Exhibition Competition on the theme 'Environmental Concerns and Eco-friendly Measures' on Friday, 05 July, 2019 to commemorate and celebrate World Environment Day and World Population Day. It is the "People's day" to do something to take care of earth and the environment. This is really important to know the ways to protect the environment. Taking this very significant concept into account, students exhibited working models, projects, photographs, posters presentations or eco-friendly products which were in lines with the theme given.40 teams participated in the competition. The exhibits clearly pointed at the environmental degradation due to pollution, global warming and urbanisation. The competition generated interest and curiosity among students. They interacted with the participants to collect information of environmental problems in the world today and measures to be taken to control the issues. 'Save Earth', 'Control Pollution' and 'Eco-friendly Solutions' were the central themes of the exhibits.

	The competition was judged by three faculty members, Ms. Sindhuja Joshi, Mr. Priyesh. G. And Ms. Nirali Verma. They judged the competition on relevance of the topic, presentation and content of exhibits by each contestant. The purpose to create awareness of environmental issues and need of eco-friendly measures was served which was the primary need of the event.
Photos:-	
Winners (if any):-	1. Ms. Aditi Kharat & Team - SY. I.T. Div. B - First Prize 2. Mr. Aman Behra & Team - SY. B. M. S. Div. B - Second Prize 3. Ms. Renuka Kerapanur - TY. B. Com. - Third Prize

Report on Sinhgadh Trekking Trip (2019-20)

The Nature Club of Pillai HOC College of Arts, Science and Commerce in collaboration with N.S.S. organized 'A One Day Trekking Trip to Sinhgadh on 23rd July, 2019.

The objective of this adventurous trip was to make students and teaching fraternity aware of environmental consciousness keeping in line with the motto of preservation of nature as a resource for economic development. Hence the slogan of this activity was "**Save Nature, Nature Will Save You'**.

Sinhgadh Fort is situated at around 35 kilometres southwest of the Pune city. Around 172 students and 8 teachers reported the base of Sinhgadh fort at 10.30 am. It took 2 hours and 30 minutes to reach the peak which is loaded with natural beauty and panoramic view of the city. The experience helped enabling the students to adjust themselves in natural environment with unforeseen eventualities consequently enhancing their skills by learning different activities during the trek. Buses departed from the fort location at 7.00 pm and reported in the college campus around 10.00 pm.

The activity conducted by Nature's Club helped to inculcate the value of unity and importance of physical exercise among students.


Pillai HOC College Of Arts, Science and Commerce
NATURE CLUB

Solid Waste Management

Name of the event :-	Solid Waste Management
Conducted by:-	**Student Council Project Initiative at PHCASC for Solid Waste Management in association with Nature club.**
Date:-	14 March, 2020
Venue:-	Near Canteen
Report:-	On 14 March 2020 Student members of Student Council along with the Nature Club headed by Prof. Ashwini Satve madam and faculty of B.Sc General Dr. Vishakha Bodade madam conducted solid waste management activity . Under the activity the process of composting was explained by Dr. Vishakha and students completed the process of composting step by step. Students from Commerce Department also participated. In an effort to manage the biodegradable waste generated in HOC, bioremediation in the form of dry composting was initiated. The canteen at our college generates a good amount of biodegradable solid waste in the form of leftovers from vegetables and non-vegetarian food apart from cereal products such as staple rice, chappatis, and vegetables etc. **Objective of the Student Council Solid waste management in collaboration with Nature's Club Project Initiative** The main objectives of the project are defined under following categories in a college campus: ● To identify and demarcate biodegradable wastes from non-biodegradable wastes generated in the college campus ● To facilitate the collection of biodegradable and dry waste & identify means for the proper disposal and recycling using the process of decomposition by bacteria ● To create awareness of the importance proper waste management among students in college campuses. **The students followed following step by Step process.** They segregated the solid waste from the refuse, they put a layer of ready made compost, on that they put layer of dry leaves and news paper and vegetable waste like onion peels and cauliflower cut into small pieces to retain moisture and added dry coconut powder, leftover curd for faster fermentation (composting). The students took care to spread the waste in the basket evenly for proper aeration and mixing. The basket was been regularly observed by the students and added ingredients as per above mentioned layers again.

	The compost thus obtained was successfully used as manure for the plants growing in the HOC campus. This was a activity to study and learn the process of Composting. The activity was a great learning experience for the student council members and other department students. It gave practical exposure and awareness as they study environment related courses and concepts in class. We thank our Principal Dr Lata Menon ma'am for her constant encouragement and support. And for providing such atmosphere and facilities for enhanced learning.
Photos:-	 
Winners(if any):-	Not applicable

Environmental Promotional Activities

REPORT ON UNNAT BHARAT ABHIYAN SURVEY

(Issues related to livestock)

Date:- 11th November, 2018

Venue:- Devloli, Sawale, Gulsunde, and Karade Village

Organized by:-Pillai HOC College of Arts, Science & Commerce

The NSS Unit of Pillai HOC College of Arts, Science & Commerce, Rasayani had active participation in Unnat Bharat Abhiyan. 50 volunteers of NSS Unit and other students had done survey in different villages like Devloli, Sawale, Gulsunde and Karade. The survey was based on Issues related to livestock. All the NSS volunteers had done this project on Sundays. At the end of the project we came to know the various problems like lack of animal housing, feed scarcity, Deficiency of vaccines and vaccination set-up faced by the villagers.

Mahatma Education Society's

Pillai HOC College of Arts, Science, Commerce, Rasayani

(NAAC Accredited)

Solid waste management

In an effort to manage the biodegradable waste generated in HOC, bioremediation in the form of dry composting was initiated. The canteen at our college generates a good amount of biodegradable solid waste in the form of leftovers from vegetables and non-vegetarian food apart from cereal products such as staple rice, chappatis, and vegetables etc. We entered into an MOU with the Shree Sidhivinayak Social Sanstha run by Mr. Ganesh Kadu with the intention of creating awareness among the students the need of waste management in our surroundings. The primary objective of the MOU was to generate interest among the students about this social issue and guide the volunteers through the process of dry composting under the guidance of our faculty Ms. Remya Madan Gopal, Ms. Ashvini Satve, Mr. Vineet Murli and Dr. Vishakha Bodade.

With an aim to intensify and elaborate the student project initiated, the 'Nature Club' of our institution initiated to incorporate more volunteers for the same. Freshers and members of Students Council and Nature Club joined hands to generate awareness of the social issue and a feasible solution we can resort to in the form of solid waste management in the campus. Nature Club further plans to organise seminars and experimental steps to make the project more relevant and successful. Students were forthcoming to be a part of the project to generate manure through composting of fod waste generated from the canteen throughout the year. The project is also a part of green initiative by our institution to inculcate interest and drive among students to be protect nature for present and future.

REPORT ON UNNAT BHARAT ABHIYAN

Date:-December 29th, 2018

Time:-2:30 p.m.-6:30.p.m.

Venue:-Devloli Gram Sabha

Organised by:-PHCASC NSS Unit

.The NSS Unit of Pillai HOC College of Arts, science and Commerce,Rasayani had an active participation in Anti-Plastic Campaign under Unnat Bharat Abhiyan. The anti-plastic campaign has been formulated to build the capacity of Devloli communities about the various effects of plastic waste on their ecosystem under the banner of UBA. This project was developed due to the acclimatized usage and habitual inappropriate disposal of polythene bags and other plastic items by community dwellers in Gulsunde communities in and around.

Despite the sensitivity of the ecosystem Gulsunde and its inhabitants find themselves in, inappropriate waste disposal is a habit of the community. Upon visiting the village, plastic waste, especially used polythene bags, were found in and around houses in the community. The anti-plastic campaign and community capacity building event brought together 30 volunteers – a mix up of students (youth) and adults who have interest in environmental advocacy.

At this point, volunteers were equipped with all the knowledge they had spoken against the excessive use of plastics and proper disposal of its resulting waste.

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REPORT ON AWARENESS ON DIGITALIZATION AND CASHLESS ECONOMY

The Digital India programme is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. Government of India has taken measures to promote a cashless economy through digital payments. In the view of this our NSS students were able to collect the information regarding awareness and use of ATM and cashless transactions during a survey of Mopada village. During the survey our NSS student explained to the people of different families about various methods of cashless transactions such as pre-paid cards, debit cards etc.

Environmental Promotional Activities

Tree Plantation Day (July 18, 2017)

To create social awareness about the importance of ‘ Conservation of Trees’, the NSS Unit of our college, like every year, organised a Tree Plantation drill in wasamebe wadi, shinde wadi and vayegharon July 18, 2017.

The students were enthusiastic about the event. The volunteers along with the Programme officer planted around 458 saplings. The programme ended on an inspirational note where the spirit of mankind was all prevalent.


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