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

## Green Audit Report

Presented By
RB ENERGY CONSULTANCY

Academic Year
2023-24

## GREEN AUDIT 2023-24

Green Audit Report of Mahatma Education Society's HOCL, Rasayani campus is conducted by RB Energy Consultancy Services and its team on **16th and 17th May 2024.**

The Green Audit report highlights the various initiatives undertaken by the institute to promote environmental sustainability and reduce its ecological footprint.

For NEW RB ENERGY CONSULTANCY

Authorised Signatory

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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 4721 students enrolled and 365 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, store room classrooms, Washrooms, Water coolers (Ladies and Gents) |
| First Floor | Store room, xerox center, computer labs, Chemistry Lab, Physics labs, Language Lab Classrooms, Washrooms (Ladies and Gents ), Student Counsellor Cell, Student Council Cell, WDC & ICC Room, First Aid Room |
| 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, CAP Cell. IQAC Room, washrooms (Gents and Ladies), Girls' Common Room, Extension Activities Cell |
| Fifth Floor | Classrooms, washrooms (Gents and Ladies), Boys Common Room, Water Cooler |
| Sixth Floor | Classrooms, washrooms (Gents and Ladies), Water Cooler, Staff Room (Gents and Ladies) |
| Seventh Floor | Staff Room, Classrooms, Washrooms (Ladies and Gents), Washrooms, water cooler (Ladies and Gents) |
| Eighth Floor | AV Room, Classrooms, Washrooms (Ladies and Gents), Washrooms (Ladies and Gents), Staff Room |
| Ninth Floor | Auditorium, Wash Rooms(Ladies and Gents) |

| **PHEC " B " Building Central Admin, Architecture, Skill Development** | |
|---|---|
| Ground Floor | RECEPTION , Chairman's Cabin, Dy CEO Cabin, Central Admin Office |
| First Floor | Principal Office, staff room , Computer Lab, Conference room, Washroom (Ladies and Gents) |
| Second Floor | Surveying Lab, Climatology Lab,, Lecture hall / Studio, Lecture Room,Washroom (Ladies and Gents) |

| | |
|---|---|
| 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 carried out on-campus, involving a physical inspection of the premises, detailed observations, document reviews, and interviews with stakeholders. Various locations, including panels and common areas of the building, were visited, and observations were documented with photographs as evidence. This report offers recommendations for addressing identified issues and provides guidance for further system improvements.

### 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 receives a good amount of daylight.

Daylight at Staircase

Good Day Light in Library

**Light in classroom**

**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

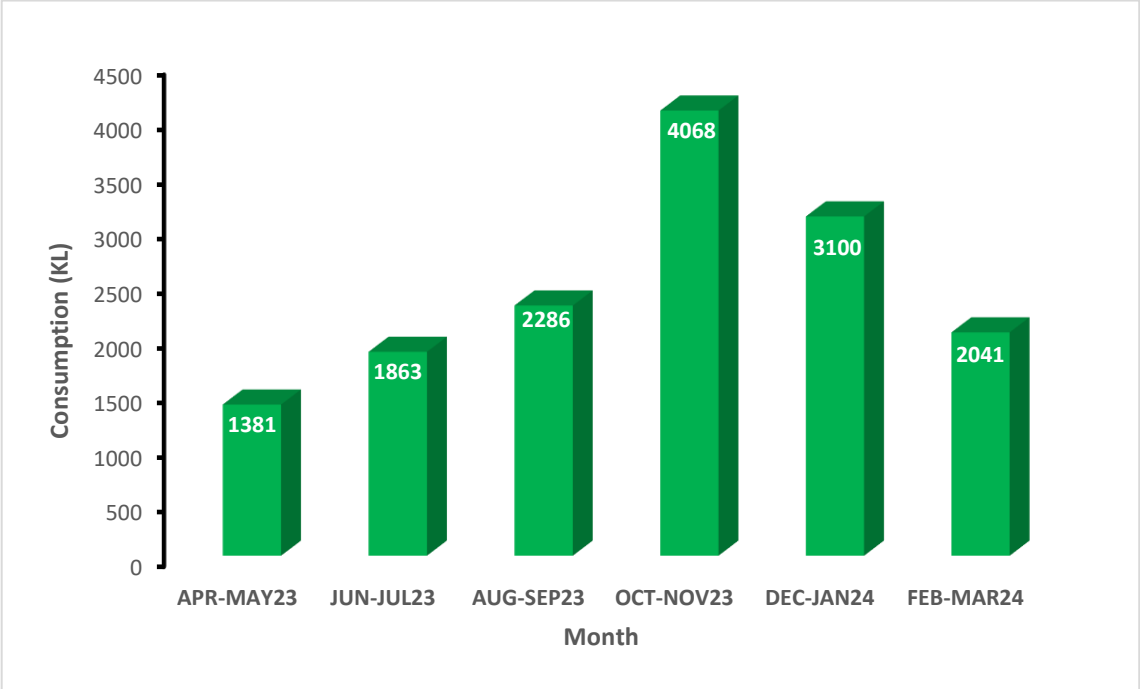
Trees around the Campus

**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 2456.5 KL/day. Total water consumption for 6 months October 2022 to March 2023 is 14739 KL. The figure below shows the consumption of water for a year from April 2023 to March 2024.




Water Consumption in Campus from April 2023 to March 2024

**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**

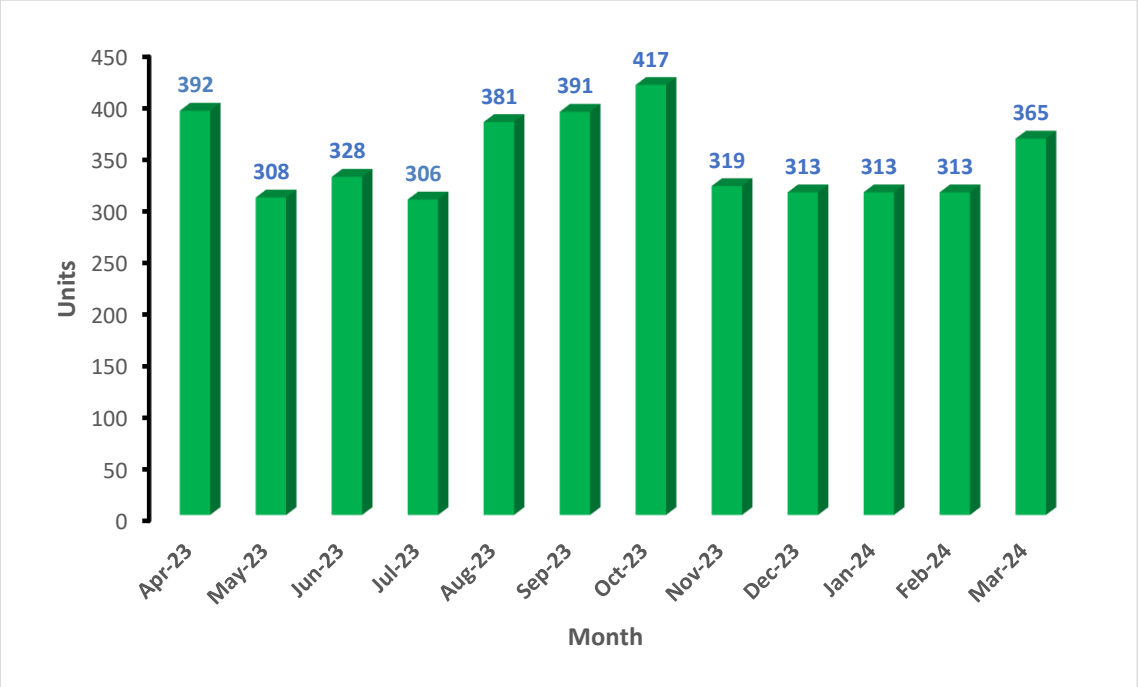
**Recommendations:**

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 Apr 2023 to Mar 2024 is around 4491.5 KWh(units).




Monthly Energy Consumption from Apr 2023 to Mar 2024

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.

**LED Bulbs**

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

7. Control sensors can be used to dim the light automatically when people are not around.

**Sensor Based 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. 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.

**Solar Panel**

### 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. Plastic bottles are given for recycling process which are collected from staffroom, classroom etc.


**Plastic Waste Recycling System**

5. Dust bins are found in every corner of every classroom.
6. Signages were found near a few dustbins.



**Dustbins**

**Recommendations:**

1. 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 disabled friendly.

z

**Handrails in Lift and washrooms for disabled**

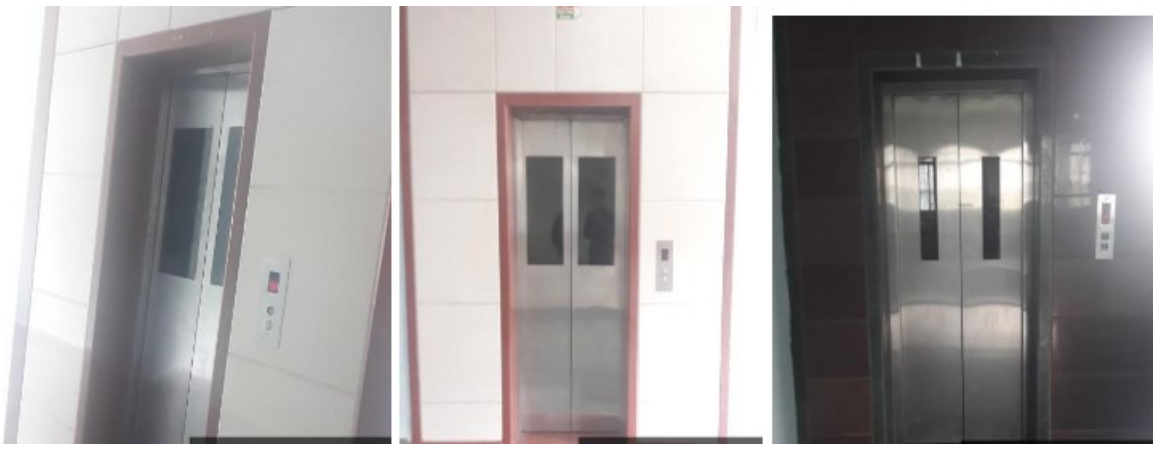
**Signage to identify disabled friendly washrooms**

3. Signage including tactile path, lights, display boards and signposts.


**Signage directing to ramp**

4. 11 Staircases are 2 feet wide and uncluttered, so can be used for emergency exit during an emergency.

5. 13 Lifts are available and power backup is available for lifts.

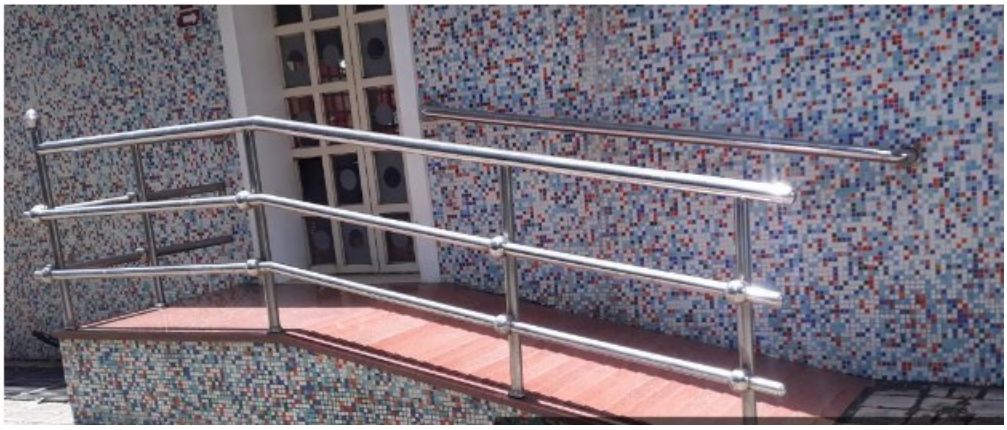


**Lifts in the campus**


**Power Backup for Lifts**

6. Fire extinguishers and fire hydrants are provided near the staircase and elevators.

7. Built environment with ramps/lifts for easy access to classrooms.



**Ramp at entrance to Lobby**

**Ramp from Main lobby to lifts**

**Ramp at basement and near recreation area**

**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. Use of public transport by staff and students. The college operates a fleet of buses to facilitate the students and staff. The institute encourages the staff and students to use the college transport instead of their own vehicles for safety, security, fuel conservation, and to reduce environmental pollution. The college buses are checked for pollution by the authorized agency.

2. Parking on the campus is not permitted. Designated staff parking is provided in the rear periphery of the campus to make the campus more pedestrian friendly and maintain greener areas and keep the air clean.

3. Pedestrian friendly pathway. As the campus is vehicle free with some exceptions, students and staff experience comfort walking through the pedestrian friendly pathways. The internal roads are lined with trees and solar lights and they are properly maintained by the campus maintenance committee.

4. Maintained green landscape. The pathways are lined by trees, hence they remain shaded and they are well maintained.

5. The students are encouraged to not use plastic and litter the same in then campus premises. Educating them about ill effects of plastic on lives and environment. Plastic Pet Bottle recycling machine are installed in the canteen premises. Dustbins are located in the campus where the waste is segregated into recyclables and biodegradable. Thus, PHCOA is sensitizing the students about plastic waste.

6. Plantation drive was organized by the first year and second year students of Pillai HOC College of Education and Research, Rasayani at Tara Village, Raigad on 9th December 2023.

**Plantation Drive**

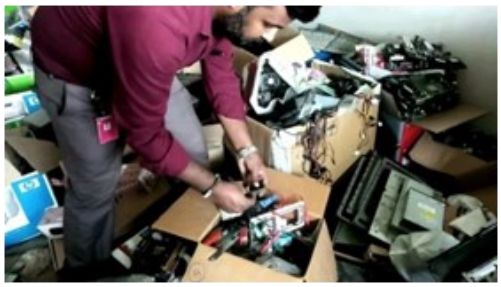
7. Nature Club organizes different events to increase green awareness among

students throughout the year.

8. NSS and Nature Club have started a “Know Green, Think Green” promotion.
9. Campus has installed rain water harvesting system
10. Campus has installed 2 composting units for solid waste management.
11. Campus has solar panels to reduce energy consumed
12. Campus has taken a great initiative of component library under e-waste management
13. Sprinklers and drip systems are used to water the garden area which saves water.
14. Biogas plant is installed in the campus.

**Biogas Plant**

15. “Zero Garbage Initiative” program was started in the campus to increase awareness about solid waste.



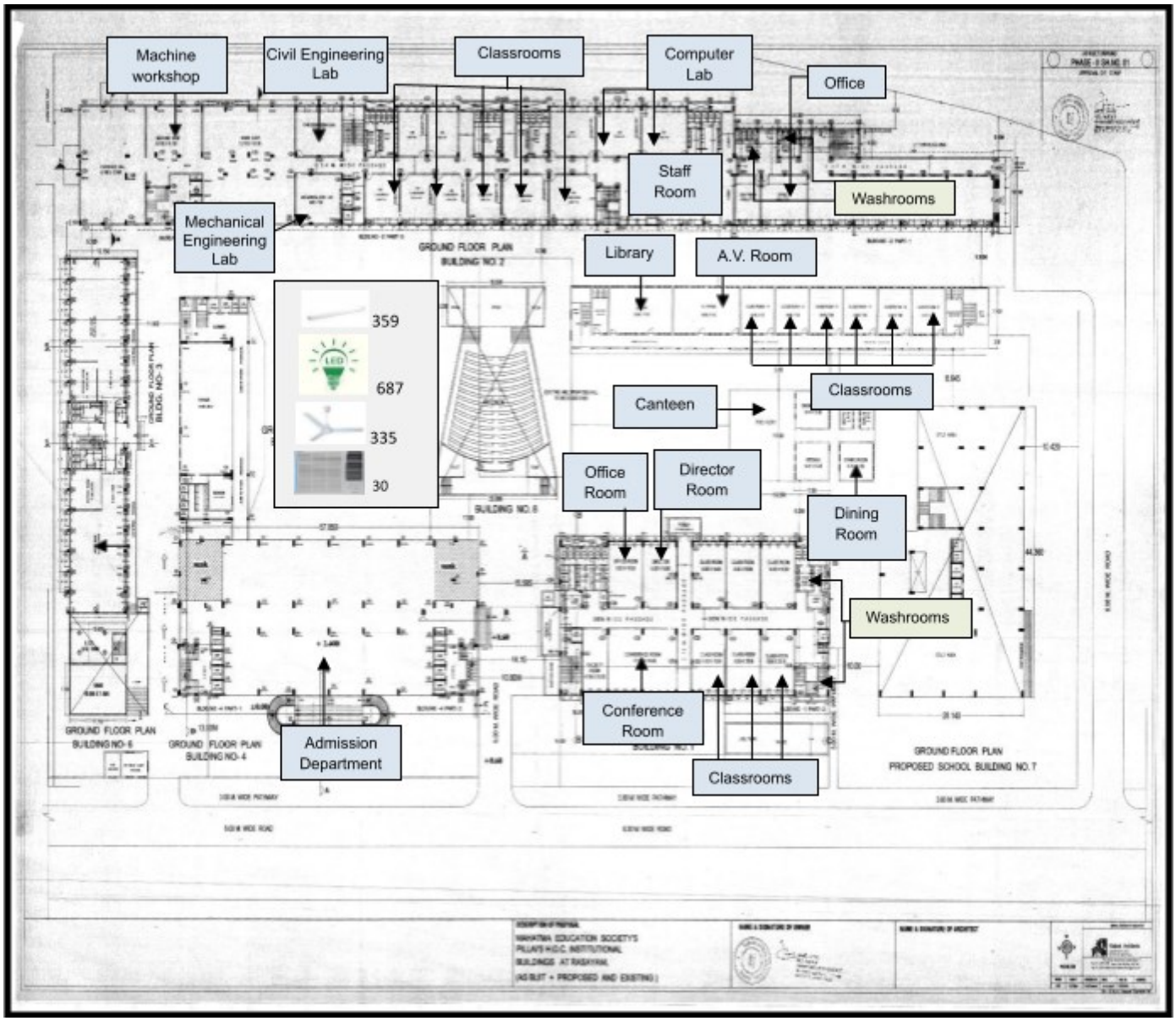
**E-Waste Management**

**Recommendations:**

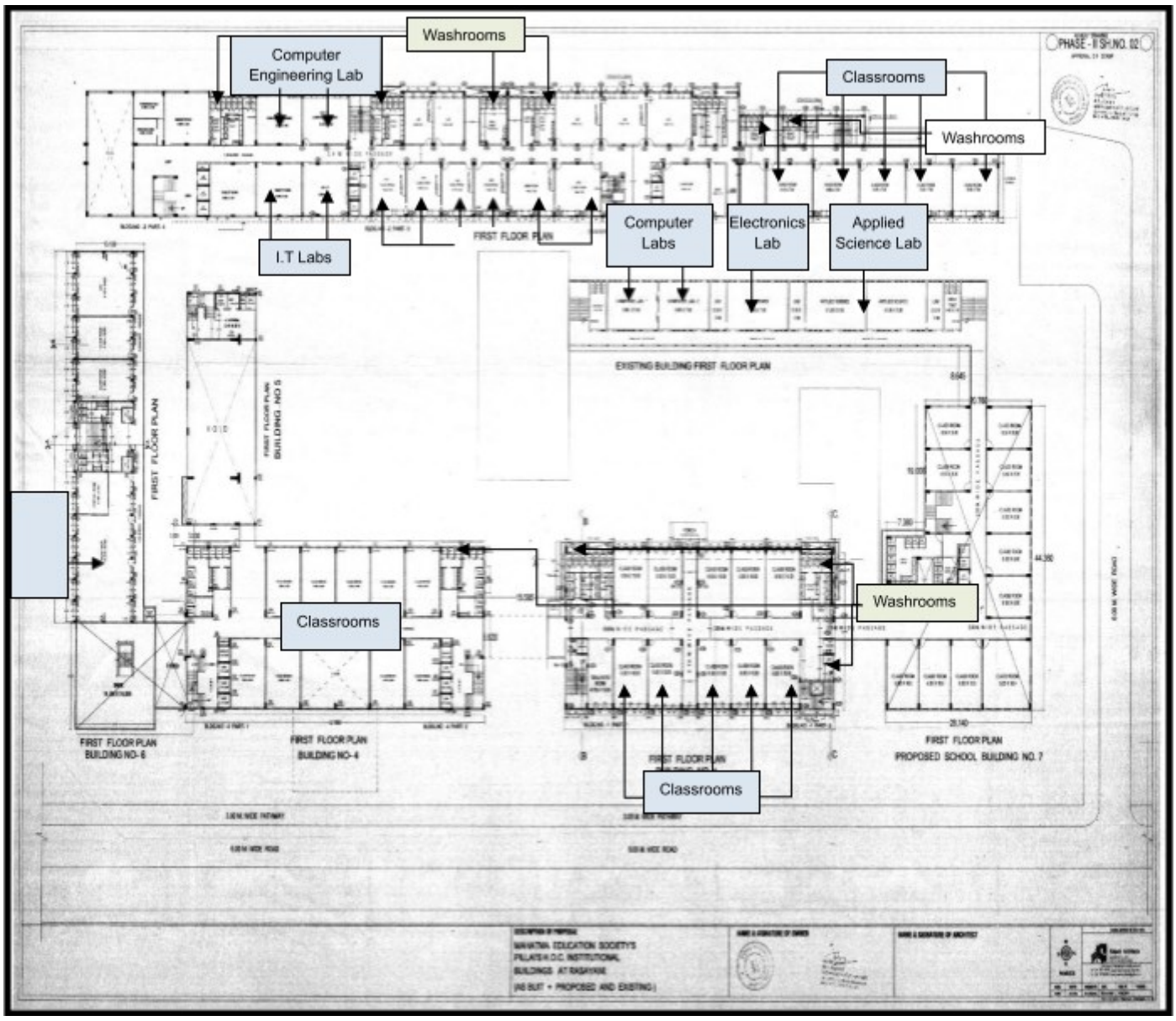
1. Implement vertical gardening on campus walls using indoor plants to enhance aesthetics and air quality.
2. Increase awareness through more webinars, workshops, and outdoor activities focused on sustainability.
3. Renovate the cooking system in the canteen to optimize gas usage and reduce energy consumption.
4. Establish a purchase policy that prioritizes energy-saving and eco-friendly products.
5. Discourage the use of plastic and thermocol plates and cups during college and department-level functions.
6. Introduce add-on courses focused on eco-friendly income generation for interested students.

# ANNEXURE 1: CAMPUS FLOOR PLAN

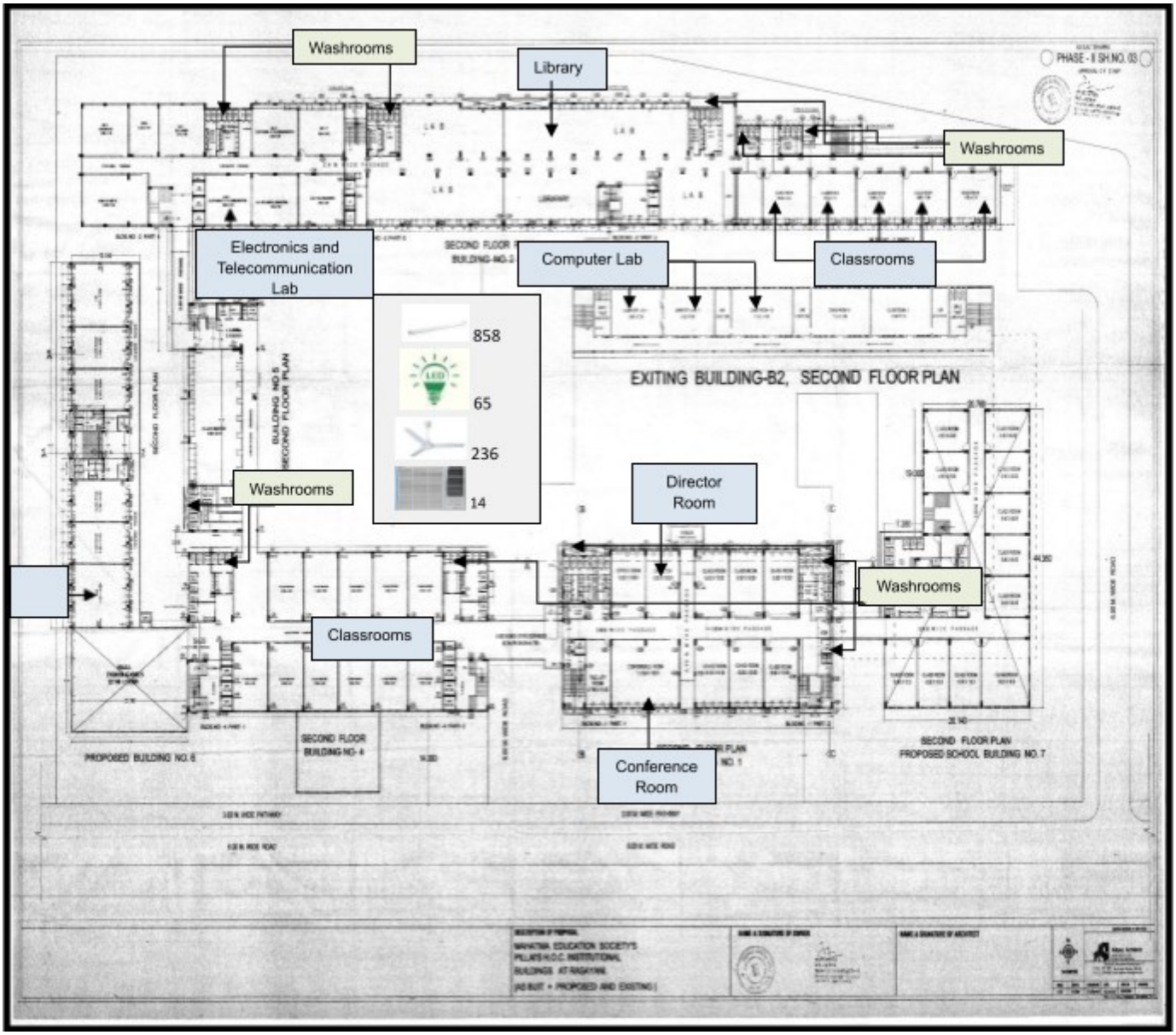
## Ground Floor



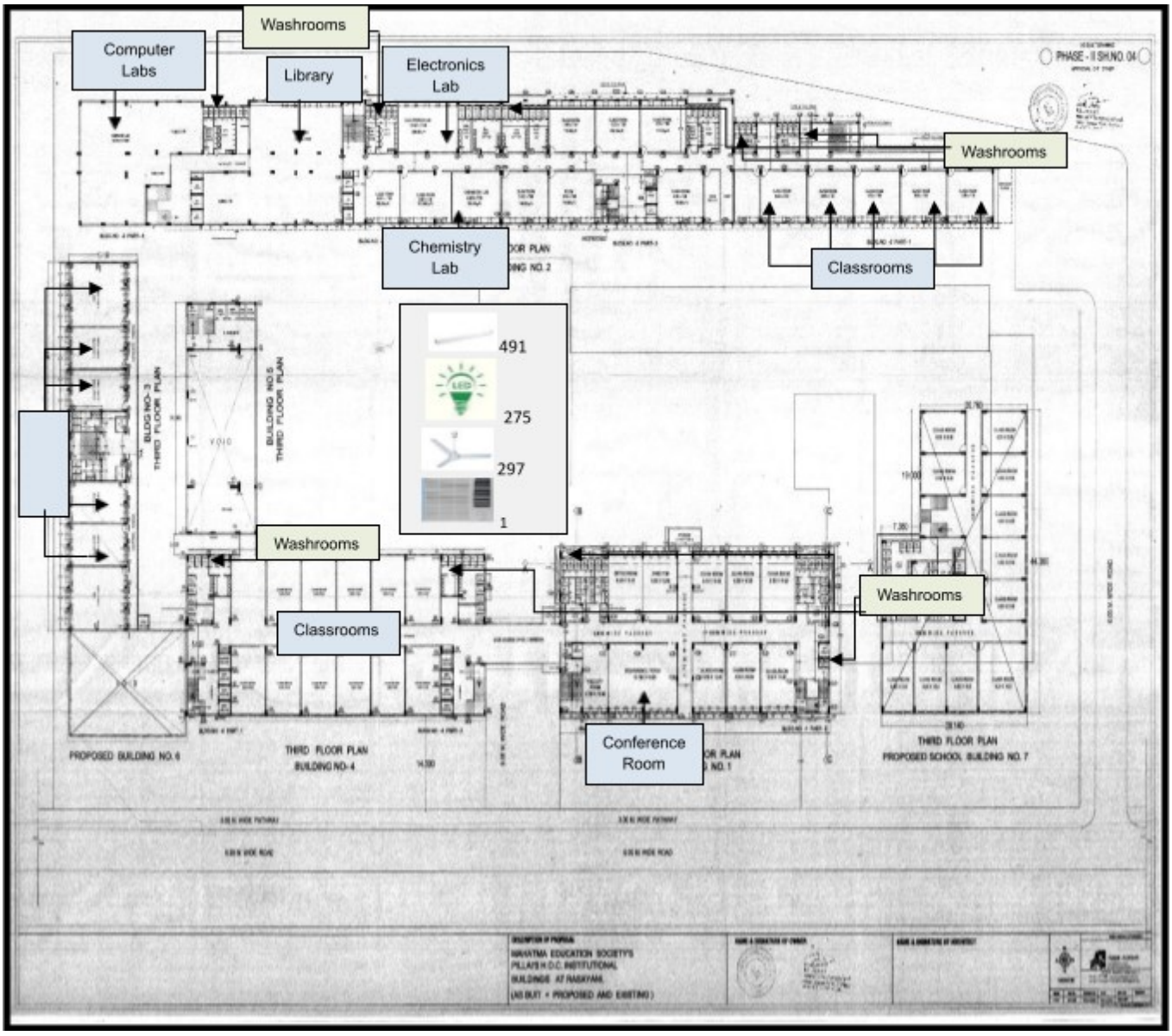
## First Floor


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

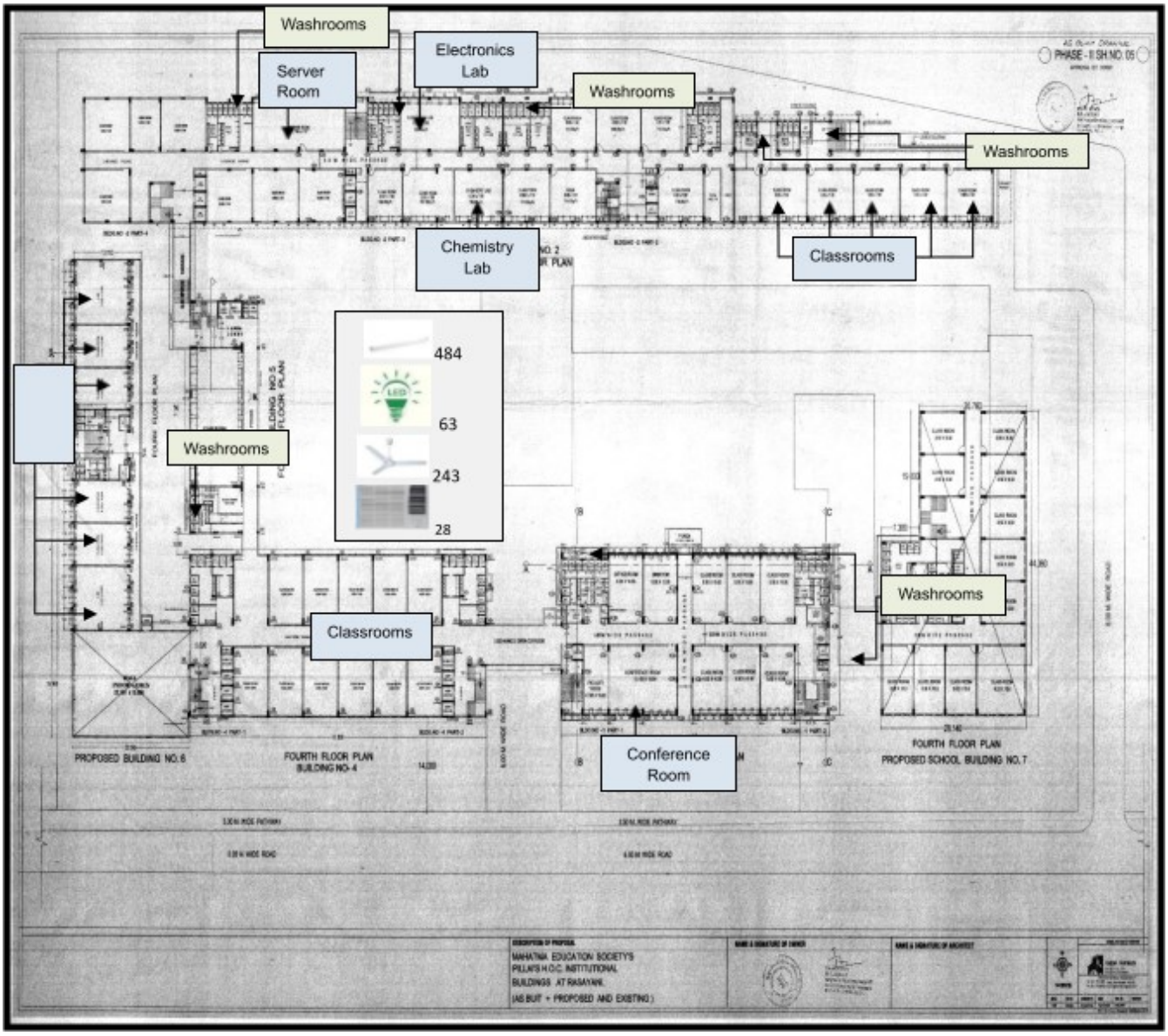
## Second Floor



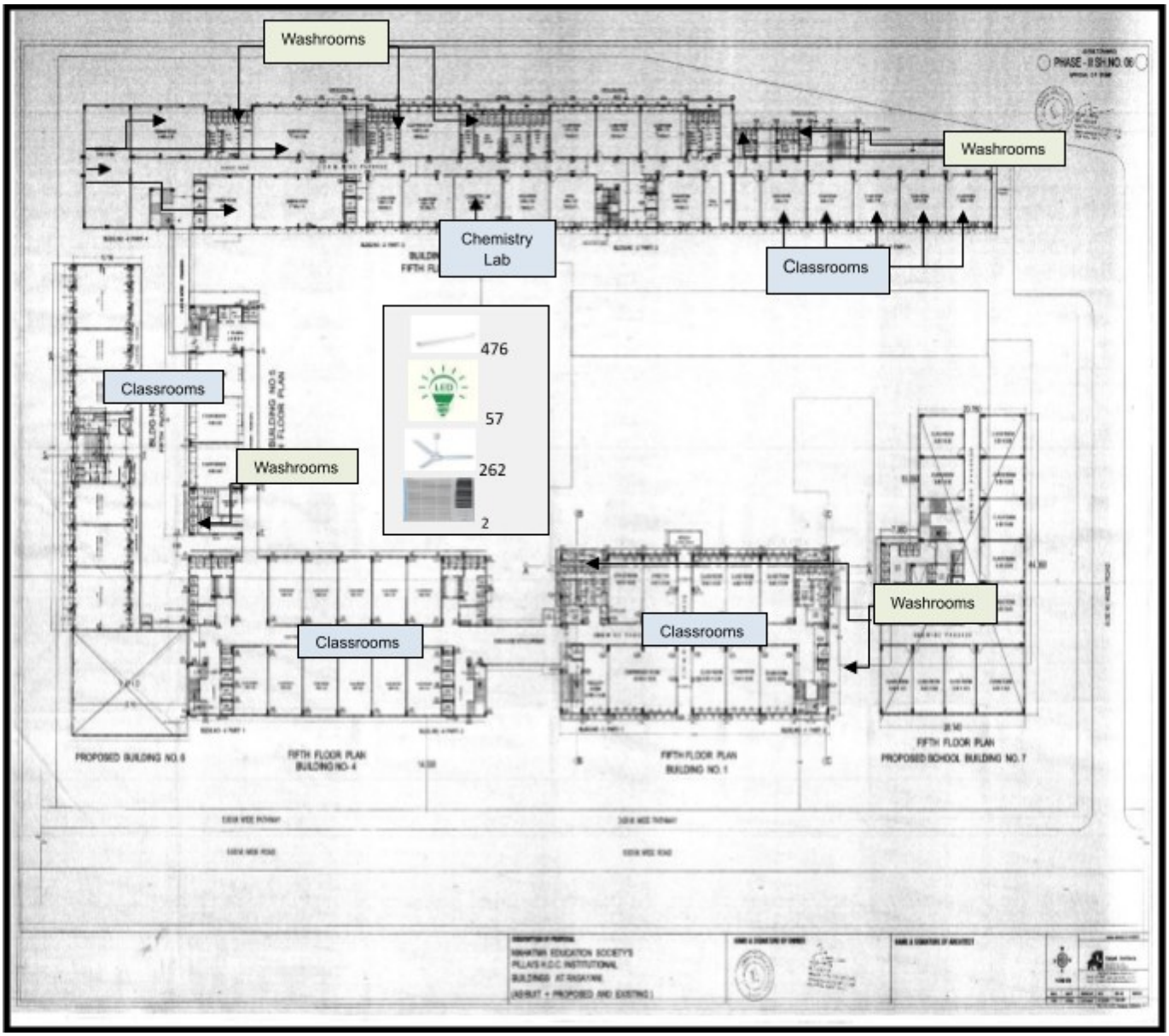
## Third Floor


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

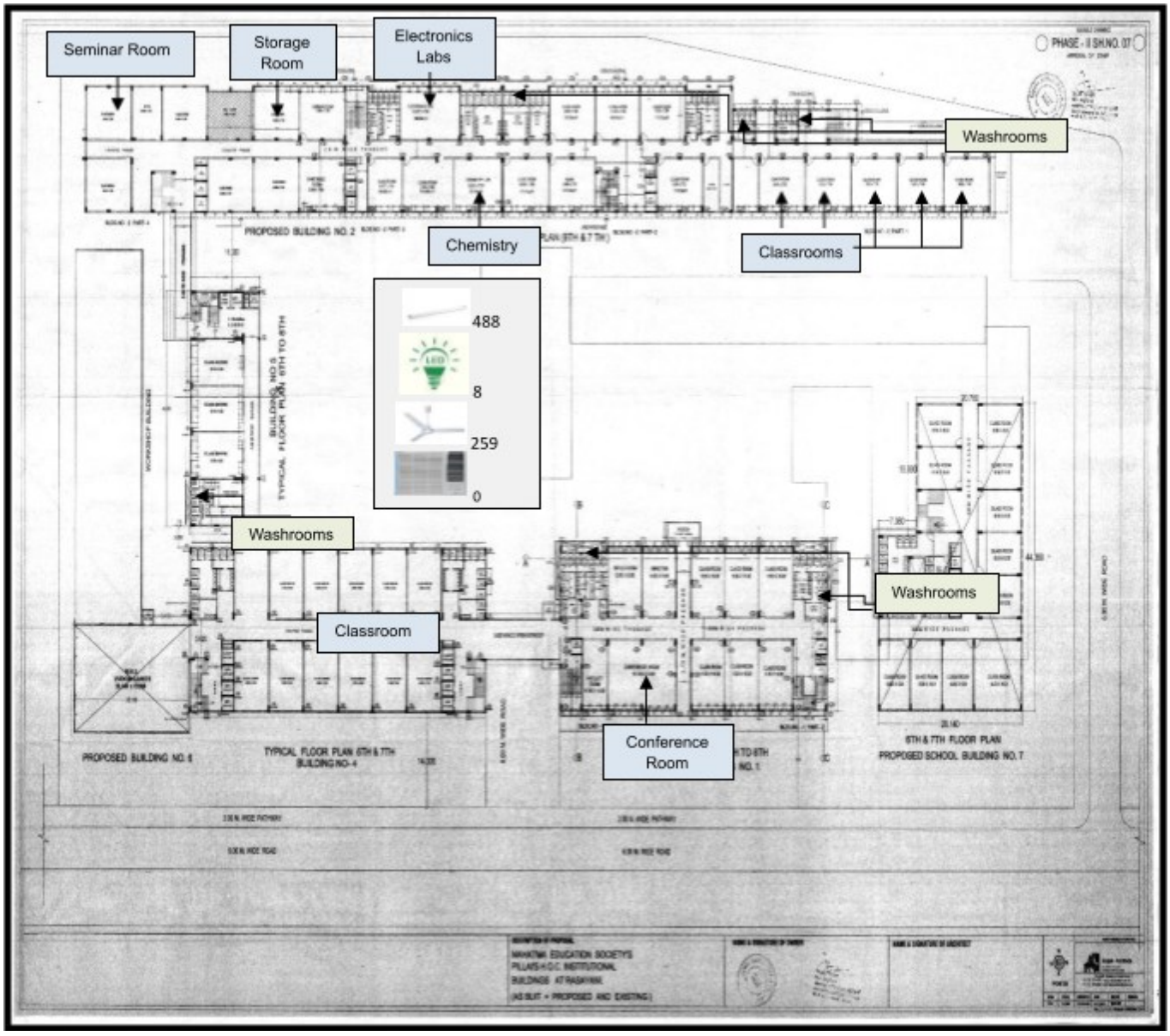
## Fourth Floor



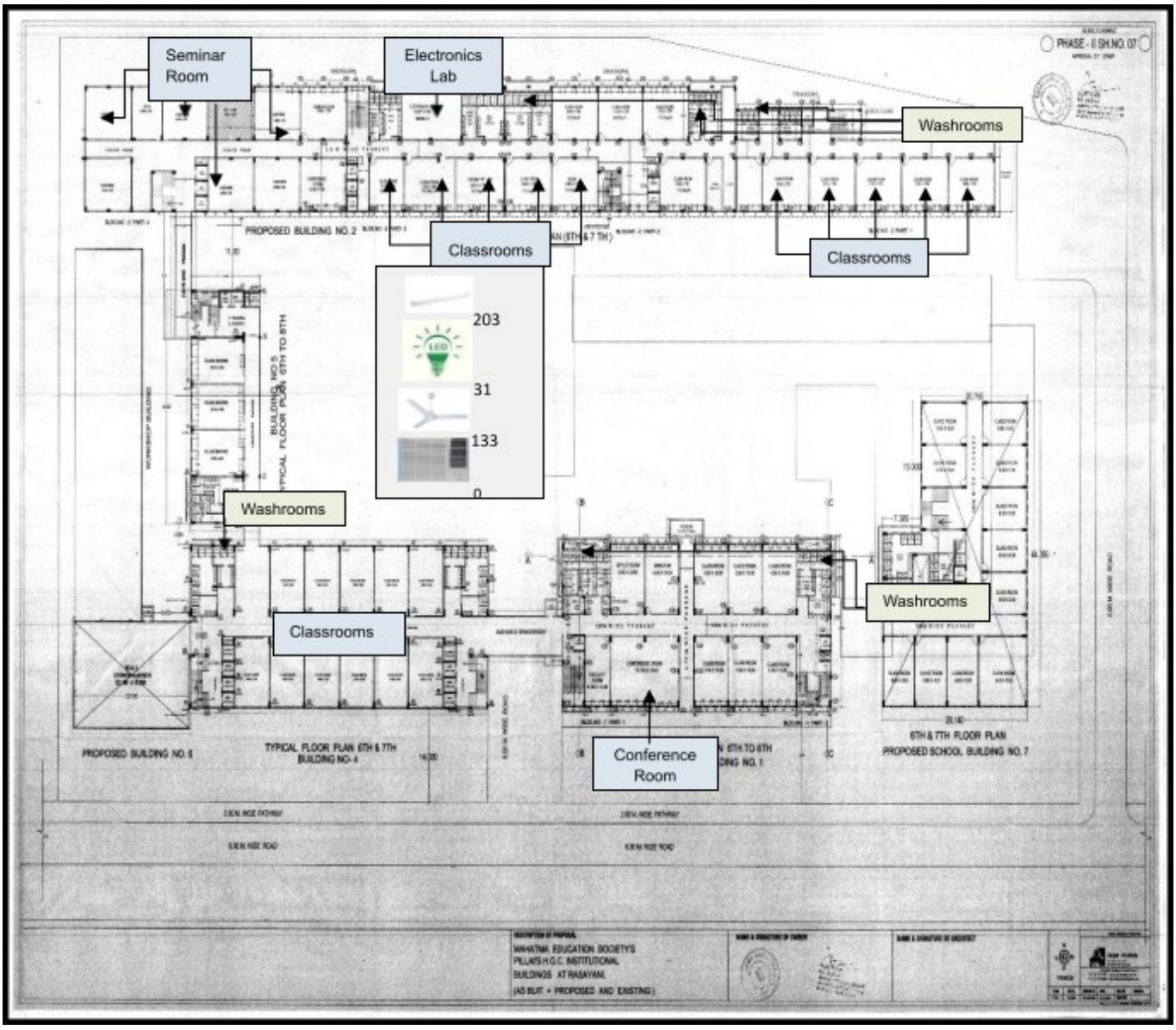
## Fifth Floor


Washrooms
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

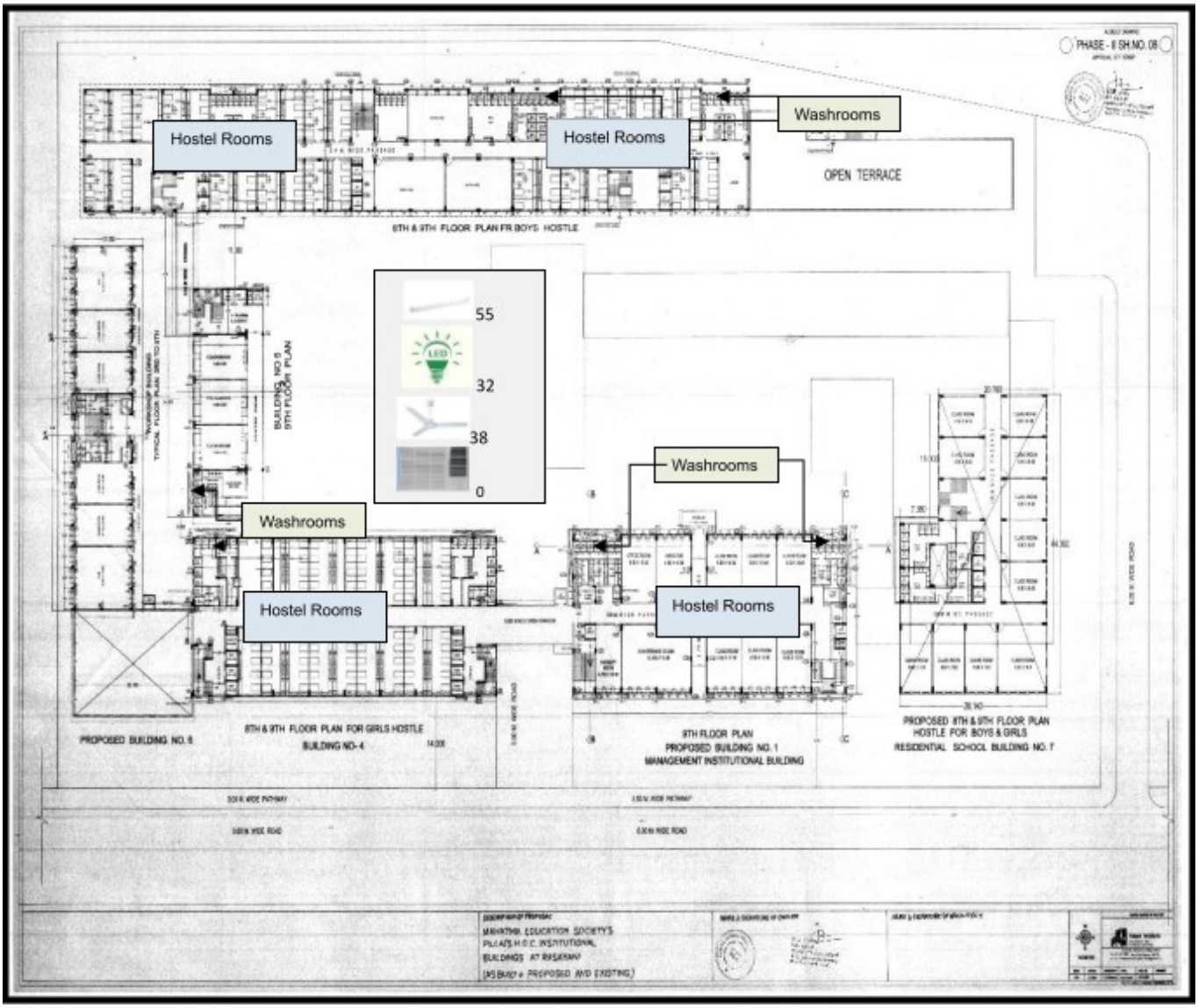
## Sixth Floor


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

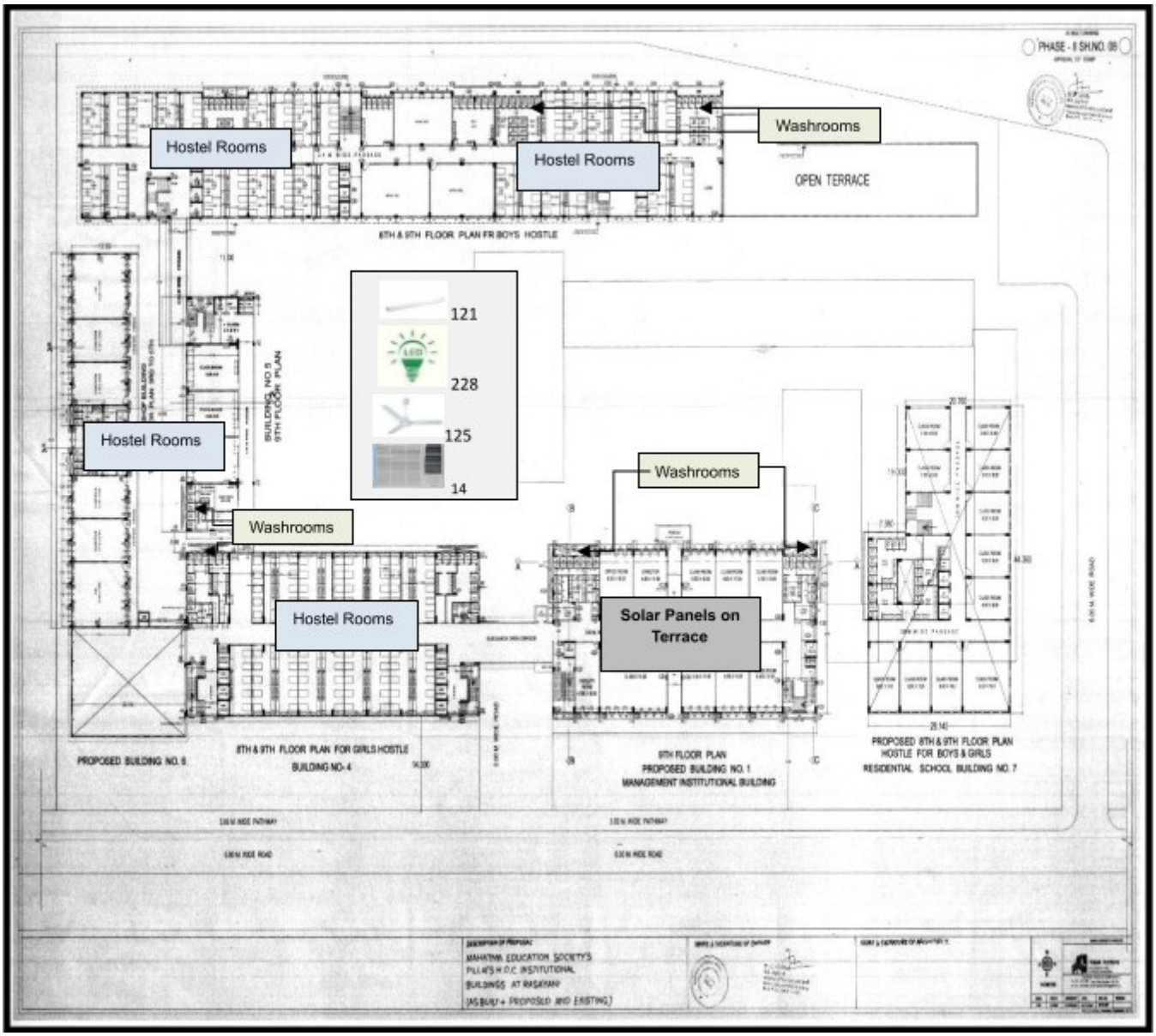
## Seventh Floor



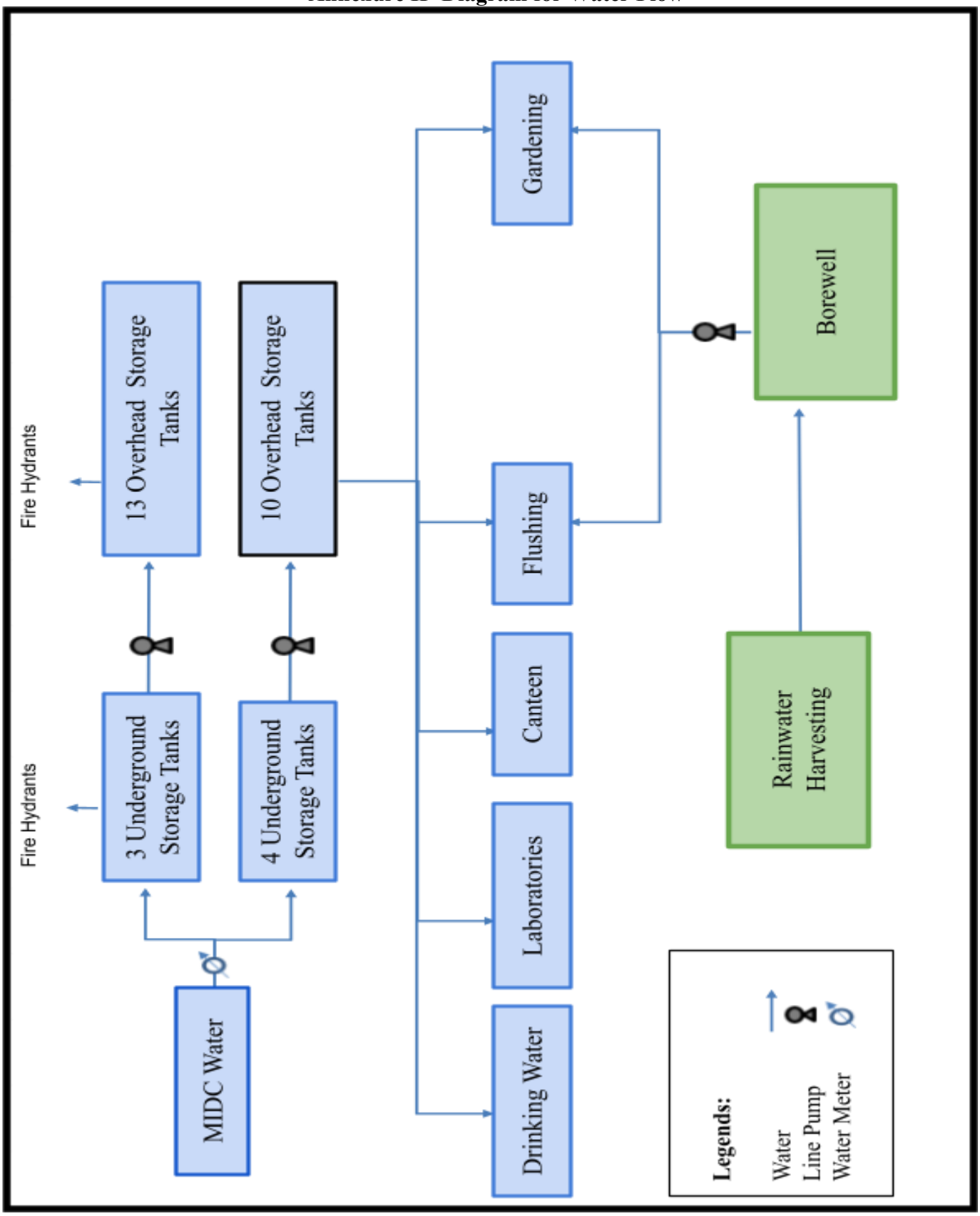
## Eighth Floor



## 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
MAHATMA EDUCATION SOCIETY'S
PILANI'S H.O.C. INSTITUTIONAL
BUILDINGS AT RASAYANI
(AS BUILT + PROPOSED AND EXISTING)

## 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 facilities | 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, IQAC Room and Staff room | 1 | 5 | 3 |
| 17 | PHCACS Exam Cell and CAP Cell | 2 | 16 | 3 |
| 18 | PHCACS - Labs and Library | 5 | 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** | | | **1279** | **77** |

## 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 | ✔ |
| 5 | Maintenance through efficient Plumbing System | ✔ |
| 6 | Rainwater harvesting | ✔ |
| 7 | Regular maintenance for leakage free plumbing system | ✔ |
| 8 | Toilet Stopcock | x |
| 9 | Water free urinals System to save water | x |

## 4. Checklist for Energy Use and Conservation

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

## 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 | ✔ |
| 8 | Printing on both sides of paper | ✔ |
| 9 | Purchase of electronic products from company's with buyback policy | ✔ |
| 10 | Rainwater harvesting | ✔ |
| 11 | Recycling project or program | x |
| 12 | Reuse of printed paper/ envelopes | ✔ |
| 13 | Reusing | x |
| 14 | Sale of books to its user for minimal charges | ✔ |
| 15 | Segregation of dry and wet waste | ✔ |

## 6. Building Maintenance

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

## 7. Checklist for Green Management

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

## ACKNOWLEDGEMENT

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

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

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

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

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

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

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