Certificate of Registration

This is to certify that

Rajarshi Shahu Mahavidyalaya, Latur (Autonomous)

(Run By- Shiv Chhatrapati Shikshan Sanstha, Latur.)

Opp. Central Bus Stand, Chandra Nagar, Latur- 413512 Maharashtra, India

has been independently assessed by QRO

and is compliant with the requirement of:

ISO 14001:2015

Environmental Management System

For the following scope of activities:

The Institute Is Affiliated To Swami Ramanand Teerth Marathwada University, Nanded And Provides Graduation And Post-Graduation Degree Programmes To The Students Pursuing Degrees In Arts, Commerce, Science, IT, BT And B. Voc. Streams

Date of Certification: 28th April 2023
1st Surveillance Audit Due: 27th April 2024
2nd Surveillance Audit Due: 27th April 2025
Certificate Expiry: 27th April 2026

Certificate Number: 305023042806E

CAB # 119005

Head of Certification

Validity of this certificate is subject to annual surveillance audits to be done successfully on or before 365 days from date of the audit.
(In case surveillance audit is not allowed to be conducted; this certificate shall be suspended / withdrawn).
The Validity of this certificate can be verified at www.qrocert.org
This certificate of registration remains the property of QRO Certification LLP, and shall be returned immediately upon request.

India Office : QRO Certification LLP
142, IInd Floor, Avtar Enclave, Near Paschim Vihar West Metro Station, Delhi-110063, (INDIA)
Website : www.qrocert.org, E-mail : info@qrocert.org

SUSTAINABLE TECHNOSOLUTIONS FOR
ENVIRONMENTAL PROTECTION PVT. LTD.

Registered address:
4A/101, Kalpataru Estate,
Jogeshwari-Vikhroli Link Road,
Andheri East, Mumbai-400093.

Office address:
1/C-1/Wing 1, Bindra Rose Society,
Mahakali Caves Road,
Andheri East, Mumbai-400093.

Website: www.stepsol.com, Email: jyoti.palekar@stepsol.com, Cell: +91 9820283540
CIN No. U93000MH2010PTC204592

Date: 17th January, 2018

Green Audit of **Shiv Chhatrapati Shikshan Sanstha's, Rajarshi Shahu Mahavidyalaya (RSM), Latur** was conducted on **11th January, 2018** by **STEP Private Limited, Mumbai**.

The audit methodology adopted was visit of college campus, checking records and interactions with faculty, non-teaching staff and students. No intrusive study was conducted during the audit.

The green audit report is under preparation and will be submitted by January 19th, 2018. The report will comprise of various environmental quotients, green initiatives taken up by the institution and suggestions & recommendations to improve environmental sustainability.

Ms. Jyoti Palekar
Managing Director
STEP Pvt. Ltd.

शिव छत्रपती शिक्षण संस्था लातूर

॥ आरोह तमसो ज्योति:॥

ESTD 1968

SHIV CHHATRAPATI SHIKSHAN SANSTHA'S

RAJARSHI SHAHU MAHAVIDYALAYA, LATUR

(AUTONOMOUS)

Green Audit Report

PREPARED BY:

STEP PRIVATE LIMITED,

MUMBAI

JANUARY 2018

step

SUSTAINABLE TECHNOSOLUTIONS FOR ENVIRONMENTAL PROTECTION PVT. LTD.

Green Audit Report of **Shiv Chhatrapati Shikshan Sanstha's, Rajarshi Shahu Mahavidyalaya (RSM), Latur** has been prepared by STEP based on visit to the college campus, checking records and interactions with faculty, non-teaching staff and students. No intrusive study was conducted during the audit.

The audit was conducted on **11th January, 2018.**

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

Ms. Jyoti Palekar
Managing Director
STEP Pvt. Ltd.

Ms. Payal Singwi
Environmental Engineer
STEP Pvt. Ltd.

Mr. Mitesh Gaikwad
Sr. Executive - Environment & Safety
STEP Pvt. Ltd.

STEP PRIVATE LIMITED MUMBAI 93.

Table of Contents

1. Introduction:

Shiv Chhatrapati Shikshan Sanstha's, Rajarshi Shahu Mahavidyalaya (RSM), Latur was established in 1970. RSM is an autonomous college of University Grant Commission (UGC). It is affiliated to Swami Ramanand Teerth Marathwada University, Nanded. The institution has undergone NAAC accreditation in March 2003 for first cycle. In the first cycle NAAC awarded "A" grade with 88.25 CGPA. Subsequently, in second cycle March 2010, NAAC awarded "A" grade with 3.38 CGPA in assessment and accreditation. The institute has Internal Quality Assurance Cell (IQAC) established in December 2003. RSM is an ISO 9001:2008 Quality Management System (QMS) certified institute. Recently the institute has volunteered re-accreditation for the third cycle in the academic year 2017-2018.

The college has strength of 3100 regular students and 5000 open university students. The institute has 48 permanent teaching faculty and 43 visiting & temporary faculty. The College offers various courses listed below:

- Bachelor of Arts in Economics, Geography, History, Music, Physical Education, Political Science, Public Administration, Sociology
- Bachelor of Commerce
- Bachelor of Science in Botany, Biotechnology, Chemistry & Analytical Chemistry, Computer Science, Mathematics, Microbiology, Physics & Electronics, Zoology & Fishery
- Languages: Hindi, English, Marathi, Pali, Sanskrit
- Others: Master of Arts (Mass Communications & Journalism), Master of Commerce, Master of Science (Biotechnology, Mathematics and Physics)

There are total 3 campus areas of the institute viz. Rajarshi Shahu Mahavidyalaya – Main campus, Rajarshi Shahu Mahavidyalaya – Biotechnology Department and Rajarshi Shahu Mahavidyalaya - Sports complex (currently under construction). STEP Private Limited (STEP) team visited all the 3 campus areas on 11th January, 2018 for Green Audit. Prior to Audit, STEP prepared questionnaire and checklists. During the audit STEP team visited entire college campus i.e. Classrooms, library, washrooms, staff room, administration department, accounts department, computer labs, solar power plant, laboratories, canteen, girls hostel, rain water harvesting system, gymkhana and auditorium. Green audit report covers all 3 campus areas.

Campus Information

The Rajarshi Shahu Mahavidyalaya – Main campus has one - four storey building with seven wings (Wing A – G). Rajarshi Shahu Mahavidyalaya – Biotechnology Department has one – three storey building. There is a separate sports complex of Rajarshi Shahu Mahavidyalaya, which is currently under construction. The physical boundaries for green audit are presented below:

Building - Rajarshi Shahu Mahavidyalaya – Main campus	
Wing A	
Floor	**Facilities**
Ground floor	Entrance foyer & parking
First floor	Cabins for Principal & Vice Principal, conference hall & college office
Second floor	Common staff room, Department of Physics and Electronics
Third floor	Classrooms
Fourth floor	Terrace
Wing B	

Ground floor	Maharashtra Public Service Commission (MPSC) & Department of Chemistry
First floor	Department of Computer Science & Information Technology
Second floor	Department of Physics & Electronics, Department of Economics & Department of Music
Third floor	Audio Visual Unit, Department of Geography & Classrooms
Fourth floor	Terrace
Wing C	
Ground floor	Desk-Top Publishing (DTP) Unit & Classrooms
First floor	Science Contact Office, Classrooms
Second floor	Department of Microbiology & Classrooms
Third floor	Classrooms
Fourth floor	Terrace
Wing D	
Ground floor	Ladies Room, National Cadet Corps (NCC)(Ladies), Yashwantrao Chavan Maharashtra Open University , Physical Education
First floor	Department of Zoology
Second floor	Department of Botany, M.C.V.C. (course for Junior college)
Third floor	Auditorium
Fourth floor	Terrace
Wing E	
Ground floor	Ladies Mess
First floor	Ladies Hostel
Second floor	Ladies Hostel
Third floor	Proposed Ladies Hostel
Fourth floor	Terrace
Wing F	
Underground floor	Book store
Ground floor	Library
First floor	Reading room for girls
Second floor	Reading room for boys
Third floor	Classrooms
Fourth Floor	Terrace
Wing G	
Ground floor	Parking
First floor	Faculty of Commerce Classrooms
Second floor	Faculty of Commerce Classrooms
Third floor	Faculty of Commerce Classrooms
Fourth Floor	Guest House
Building - Rajarshi Shahu Mahavidyalaya – Biotechnology Department	
Ground floor	College office – Administration and Director office
First floor	Classrooms and biotechnology lab
Second floor	Classrooms and biotechnology lab
Third floor	biotechnology labs
Building - Rajarshi Shahu Mahavidyalaya - sports complex (Currently under construction)	
Indoor stadium, Swimming pool, Open ground for outdoor games	

In order to gather necessary information STEP team interacted with following stakeholders:

Name	Department
Dr. Salunke	College Principal
Mr. Deshpande	Board member of Shiv Chhatrapati Shikshan Sanstha
Dr. Sachin Kulkarni	Head of Biotechnology Department
Prof. Vishwanath Pancham	Faculty
Mr. Chavan	Office Staff
Mr. Suryakant	Librarian
Mr. Madhav	BSc second year student
Ms. Sukanya Patil	Student
Mr. Ajay Choudhary	BSc second year student
Mr. Rohan Patil	Student
Ms. Pradnya Shinde	Student

2. Environmental Setting:

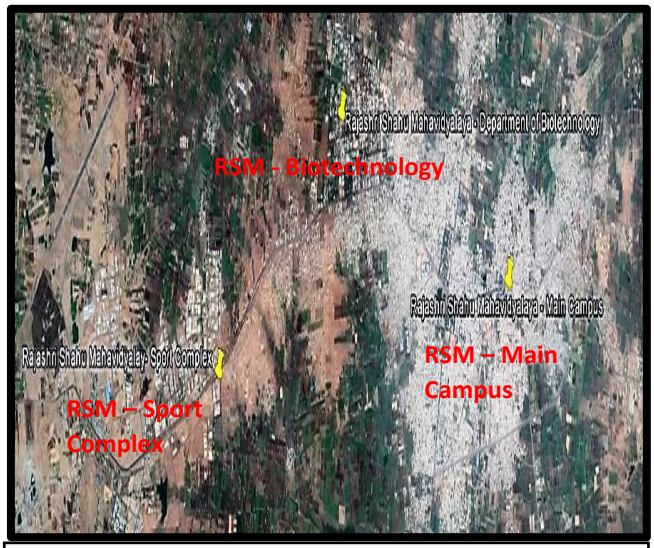
RMS is an autonomous college of UGC and was established by Shiv Chhatrapati Shikshan Sanstha. The Institute has a sprawling campus and is spread over 3 acres.

RMS – Main Campus is situated in central area of Latur. Places around the campus are Latur bus stand, Latur railway station, Ganj Golai market etc. Main campus is situated in market and commercial area. Biotechnology department building is situated in MIDC area which is 12 km from main campus. The sports complex is also located in MIDC area which is 7 km from the main campus.

RSM – Main Campus building

RSM – Biotechnology Department

RSM – Sport Complex



RSM all 3 campus

3. Green Audit:

Green audit covered 13 major areas, which were further divided into sub-areas. The compliance was checked for each of these areas.

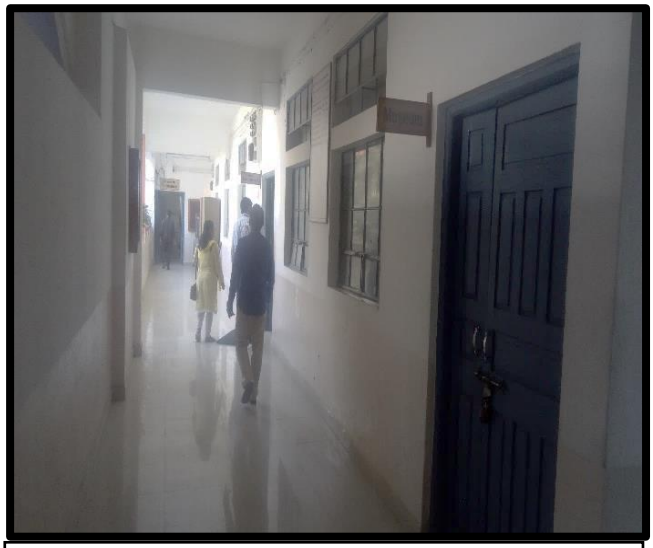
a) Good Daylight Design and Ventilation
b) Water Efficiency
c) Wastewater Management
d) Indoor Air Quality
e) Energy Efficiency
f) On-site Energy Generation
g) Temperature and Acoustic Control
h) Paper Waste Management
i) E-Waste Management
j) Canteen and Solid Waste Management
k) Universal Access and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

3.1 Good Daylight Design and Ventilation:

a) All the corridors receive fairly good daylight due to large windows, except some corridors where daylight is not adequate.
b) Corridors are wide with good ceiling height.
c) Classrooms also have high ceiling with wide doors and large windows. Windows are kept open to receive sunlight.
d) White wash-paint is applied on classroom walls, corridors and labs, which enhances the light effect.
e) Curtains are provided on some of the windows to avoid glare.
f) Laboratories are provided with exhaust fans to disperse heat, fumes and odours.
g) Conventional tube lights & fans are installed in classrooms and labs. Institute has carried out energy audit in 2017. As per the audit recommendation, institute is in process of replacing the dysfunctional conventional tube lights with LED lights. The energy audit report was not available for review.

Good ceiling height with large windows

Exhaust fan in laboratories for ventilation



Good daylight in part of a Corridor

Daylight and ventilation in laboratories

3.2 Water Efficiency:

a) In RSM- Main campus, water supply is from Latur city Municipal Corporation (LCMC) till year 2015. Currently the institute is fulfilling their water requirement by two borewells available in-house.
b) Borewell water is pumped and stored in three storage tanks (Make: Sintex, Capacity: 2 tanks- 5 KL & 1 RCC tank- 12 KL) located on terrace. For drinking purpose, water is treated through Reverse Osmosis (RO capacity– 1000 LPH) treatment and supplied through water coolers for entire premises. RO rejects are collected in separate underground tank in which borewell water is mixed and used for gardening and secondary usage (floor mopping, toilet flushing etc.).
c) LCMC supplies water to biotechnology department and sports complex. In RSM – Biotechnology department, the LCMC water is stored in underground RCC tank – 5 KL capacity. It is then pumped to a overhead RCC tank (5 KL capacity) and distributed through coolers for drinking purpose in entire building.
d) In RSM – Biotechnology department & sports complex, borewell water (1 each) is also available. This borewell water is used for toilet flushing and construction purpose.
e) In RSM – Biotechnology department, there is a provision to store rain water in 5 KL Sintex tank. After the initial monsoon days, college staff checks pH of rain water. Once it is neutral, the rain water is directly collected in this tank.
f) Latur is in Marathwada region of Maharashtra, which is water scarce area. Therefore, rooftop rain water harvesting system is installed for recharging ground water and meeting water requirements.
g) Rain water from rooftop is collected in 5 KL- Sintex tank located on ground floor. An outlet of this tank is connected to rain water harvesting pits. Rain water harvesting pits consist of layers of gravels, aggregates, granules, coarse sand and fine sand for rain water filtration.
h) Two rainwater harvesting recharge pits (Capacity - 42 KL each) are provided for bore wells.
i) Apart from this, one more bore well with recharge pit is installed in biotechnology campus to meet the water requirement.
j) The water distribution diagram for RSM – Main campus and Biotechnology department is presented in **Annexure 1**.
k) Mops are used for floor cleaning. Mopping frequency is once in week.

l) No leaking faucets were seen anywhere except on the ground floor of main campus, where one drinking water tap was leaking.
m) In-house technical staff is informed of such water leakage and they immediately to attend to the complaint.
n) Washrooms do not have water conservation faucets. Installation of such faucets can save water and will help in minimising the water footprint of the institute.
o) Dual flushing system is not provided in the toilets.
p) No signage emphasising water conservation were found in the institute.

Old taps in wash basin

Leaking tap in main campus building

Reverse osmosis (RO) system- Main campus

Water filter – Biotechnology department

3.3 Wastewater Management:

a) Sanitary wastewater generated from washrooms is connected to sewerage system provided by LCMC.
b) Chemical wastewater generated in chemical labs and waste water generated from biotechnology lab is also connected to sewerage system. In future there is plan for treatment and reuse of this waste water.
c) Waste water recycle is not practiced in the institute as grey water/ sewage treatment /recycle facility is not provided. In current year, the college plans to implement such facility for the campus.

3.4 Indoor Air Quality:

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.
- Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.
- Volatile organic compounds – 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.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities

Major observations under indoor air quality is as below:

a) Ventilation is achieved by fans in the institute and air conditioners in some rooms e.g. labs, computer server room.
b) Heating Ventilation and Air Conditioning (HVAC) system is not installed.
c) Smoke detectors are not provided in the institute.
d) Exhaust fans are only provided in washrooms and chemistry lab.
e) No indoor plants were observed in the entire institute. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer **Annexure 2** for details.
f) Green belts have been set up in campus areas.
g) IAQ awareness signage's can be displayed for sources & causes of indoor air pollution in the institute for making students aware of indoor air pollution and their health impacts.

3.5 Energy Efficiency:

Electricity:

Two electricity meters are provided in RSM - Main campus area and one meter is provided RSM – Biotechnology department. Sports complex building is under construction. The monthly average electricity consumption of RSM – Main campus and Biotechnology department from January 2017 to December 2017 is 14871 KWh and 1914 KWh respectively. Electricity consumption of RSM – Main campus and RSM – Biotechnology department is graphically presented in Figure 1 & 2 respectively.

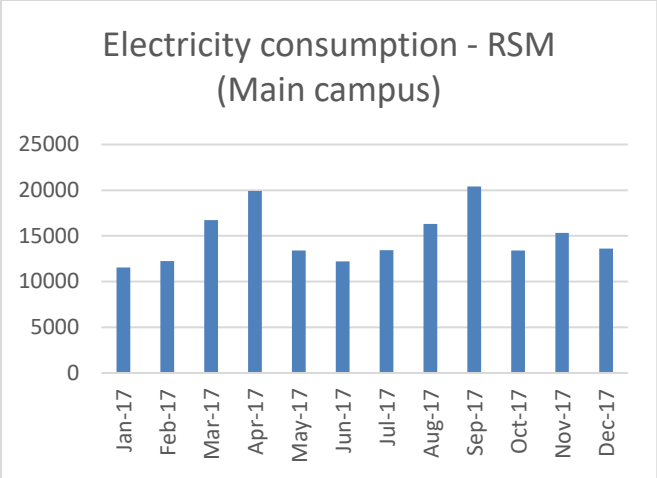


Figure 1: Electricity consumption (RSM - Main campus)

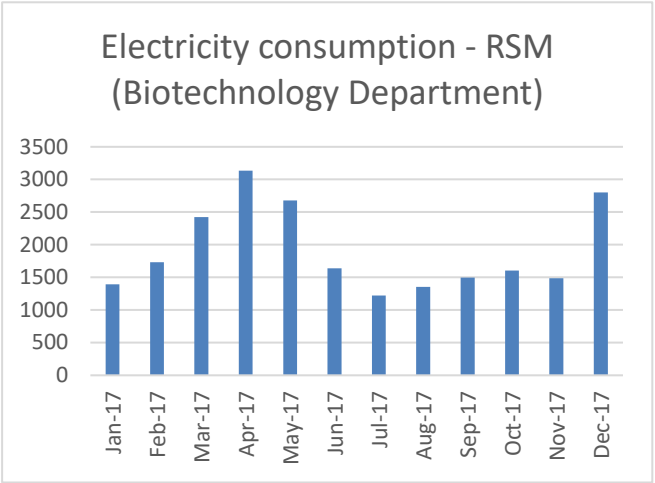


Figure 2: Electricity consumption (RSM - Biotechnology department)

The above graph indicates the energy consumption of RSM for year 2017. The maximum energy consumptions for 2017 are in April & September for main campus; and April & December for Biotechnology department. Minimum energy consumption is in January & June for main campus; and July & August for Biotechnology department. Further we presume that the institute has holiday in April - June each year however some of the classrooms are utilised for competitive exam purpose still the electricity consumption is maximum in April. Further, it will be useful to understand the reasons for high electricity consumption in Biotechnology department in December, which is winter time. It is necessary to monitor & understand electricity consumption pattern; and identify the reasons of higher than expected consumption. The institute should follow the recommendations of energy audit; in any & take corrective action (the energy audit report was not available for review).

The areas of major consumption of electricity are:
Tube Lights – 627 approximately
Fans – 250 nos. approximately
Air Conditioners – 5 nos. (Energy rated)
Computers - 466 units
Projector – 5 units approximately
Refrigerators- 5 units approximately
Printers – 21 approximately

The list of electrical appliances and possible energy intensive areas in the institute is provided in **Annexure 3**.

It was observed that:

a) In RSM – Main campus 3 air conditioners are installed in zoology lab, library, computer server room respectively and 2 are installed in RSM – Biotechnology department. All the air-conditioners are three start rated.
b) New refrigerators are with three & four star energy ratings; and the old refrigerators are without energy rating [standards set by Bureau of Energy Efficiency (BEE)].

c) Uninterruptible power supply (UPS) system with inverters is installed in every department and labs as back up in case of power failure. UPS system is typically used to protect hardware such as computers, data centres, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause serious business disruption or data loss.
d) Reflectors, which enhance the available light, are not provided for tube lights.
e) All computers have LED screens; computers are always kept on standby mode with power saving screensavers.
f) Multiple tube lights and fans are connected to one switch. Thus when a classroom is not fully occupied, the fans & tube lights in vacant area may be also on. Corridor has multiple tube lights which can be replaced by CFL/LED, in areas where they are not yet installed/ replaced.
g) Non-teaching staff switches on all lights & fans in the morning and shut down directly in evening. Lack of control on usage may be increasing the energy consumption.
h) There are no signage encouraging the users to switch off lights and fans when not in use to save electricity. Providing signage through screensavers & posters near electrical switches will help in making students responsible for conservation of electricity.

Multiple tube lights /CFL lights in corridor

Multiple tube lights in labs

Star-rated refrigerator

DG set

3.6 On site energy generation (usage of LPG/ Natural Gas):

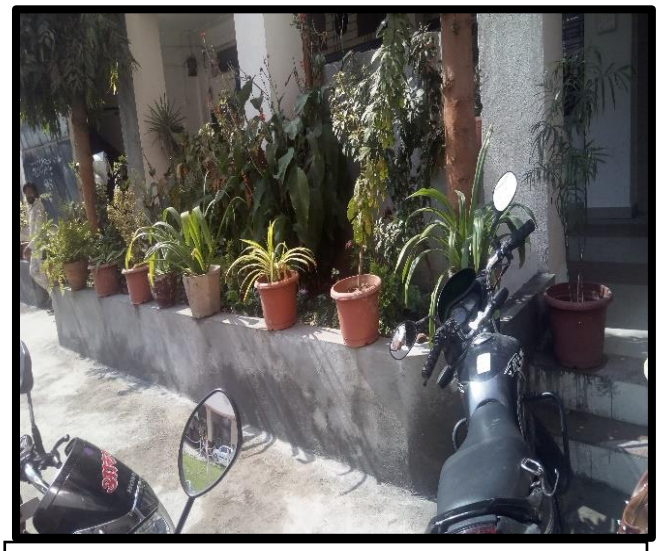
a) Renewable energy source viz. solar energy is used to meet a part of energy requirement. Solar panels (Capacity - 30 kW, Make - Relyonsolar) are installed in 2017 on terrace of RSM – Main campus. Solar system will be in operation from 2018.
b) LPG gas cylinders are used in laboratories for experiments and in canteen for cooking. LPG gas is not used anywhere else.
c) There is no dedicated gas storage area. Gas cylinders are refilled as and when required.
d) In RSM – Main campus there are three diesel generators installed as back-up in case of power failure.

Solar Panels on Terrace

Use of LPG cylinders in lab

3.7 Temperature and Acoustic Control:

a) White washed rooms & passages and white/ off-white flooring improve the lighting conditions.
b) No major noise pollution was observed during audit.
c) RSM has done tree plantation around the building which helps in reducing temperature and acoustic control.



Green belt in institute

Green belt in institute

3.8 Paper Waste Management:

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

It was observed that:

a) Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digitalisation (scanning) is practised.
b) The college library is connected to other college libraries under the Inter Library Loan facilities, E-Library facilities with INFLIBNET N-List and DELNET Consortia.
c) The library is fully automated with bar-coded books, library membership smart cards are issued to students to get access to these books.
d) There are 6000+ e-journals and 3000000+ e-books in library.
e) Internal notices and communications are through E mail/SMS/Digital display.
f) Faculty and administration staff uses old papers and envelops for internal usages as rough work, file markers, page separators etc.
g) Paper notices are displayed on the notice boards. The dissertation reports, journals, and answer papers are stored as per the University rules. Most of the storage is in computer laboratory, library and staff room. After couple of years, old submissions are archived and stored in a record room and other paper waste is sold to scrap dealer.

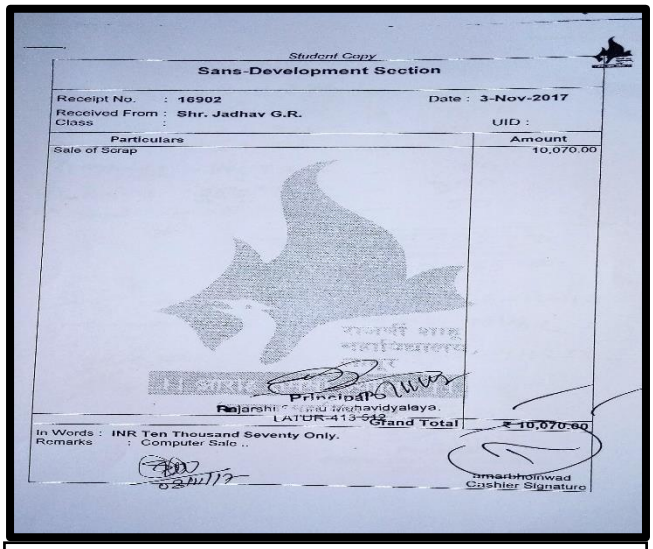
Old journals storage in zoology department

Old books storage in commerce department

3.9 E-Waste Management:

a) RSM is digitalized to extent. This include library, notice board, internal mails etc.
b) The institute has 466 PCs, 31 printers, 5 air conditioners in working condition.
c) Annual E-waste generated in 2017 was 187 CPUs, 193 monitors, 19 SMPS, key board & mouse 8 kgs, printers 35 kgs and speakers 5.
d) All E-waste is collected and stored in respective department, and once in a year it is to an authorise recycler.

e) There is documented policy for collection, segregation of e-waste. However, policy was not available for review.



Student Copy

Sans-Development Section

Receipt No. : 16902 Date : 3-Nov-2017

Received From : Shri. Jadhav G.R.

Class : UID :

Particulars	Amount
Sale of Scrap	10,070.00

Principal

Rajarshi Shahu Mahavidyalaya.

LATUR-413 512

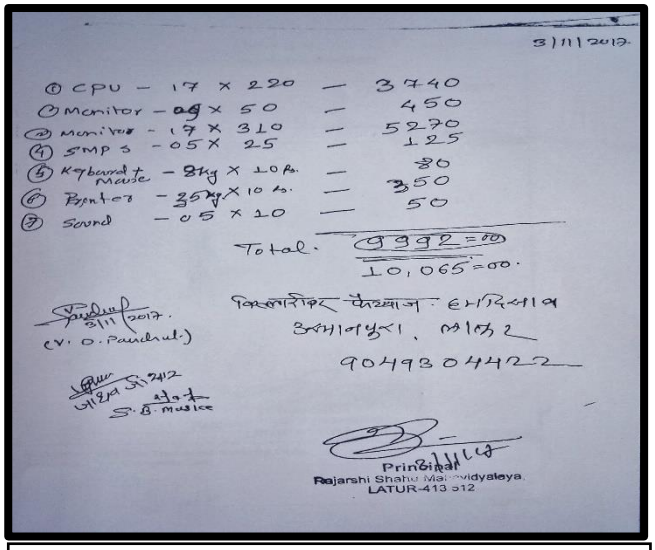
Grand Total ₹ 10,070.00

In Words : INR Ten Thousand Seventy Only.

Remarks : Computer Sale ..

Cashier Signature

Copy of E-waste sale (pg. 1)



3/11/2017.

① CPU – 17 × 220 – 3740

② Monitor – 09 × 50 – 450

③ Monitor – 17 × 310 – 5270

④ SMPS – 05 × 25 – 125

⑤ Keyboard + Mouse – 8kg × 10 Rs. – 80

⑥ Printer – 35kg × 10 Rs. – 350

⑦ Sound – 05 × 10 – 50

Total. 9992=00

10,065=00.

3/11/2017.

(V. O. Panchal.)

S. B. Mulke

Principal

Rajarshi Shahu Mahavidyalaya.

LATUR-413 512

Copy of E-waste sale (pg. 2)

3.10 Solid Waste Management:

It was observed that:

a) Wet waste and dry waste segregation is practised in the main campus premises. Waste is handed over to LCMC. Girls hostel in main campus, is the key area where dry & wet waste is generated. The amount of biodegradable waste generation is nearly 4-5 kg/day. This waste is handed over to LCMC. There is no signage on the food wastage or segregation of wet and dry waste.

b) Wet waste generated in biotechnology department's canteen is collected in a pit behind canteen. This waste is subjected for windrow composting. Windrow composting is the production of compost by piling organic matter or biodegradable waste. These rows are mixed periodically to improve the porosity, oxygen content, remove moisture and redistribute cold & hot portions of the pile.

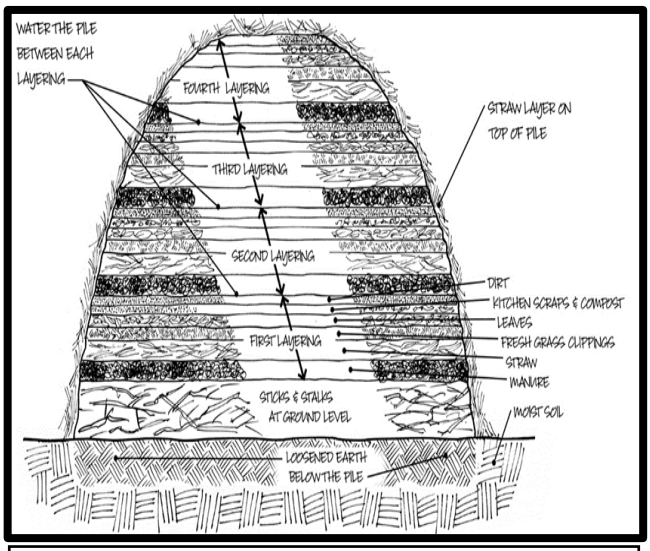
c) In other areas like classrooms, it is mostly paper waste and plastic wrappers.

d) Scrapped benches from main campus are sent to biotechnology department where they are repaired and reused.

Dustbin for collection of waste

Solid waste generation

Scrapped benches from main campus to biotechnology department



Composting Diagram

3.11 Universal Access and Efficient Operation and Maintenance of Building:

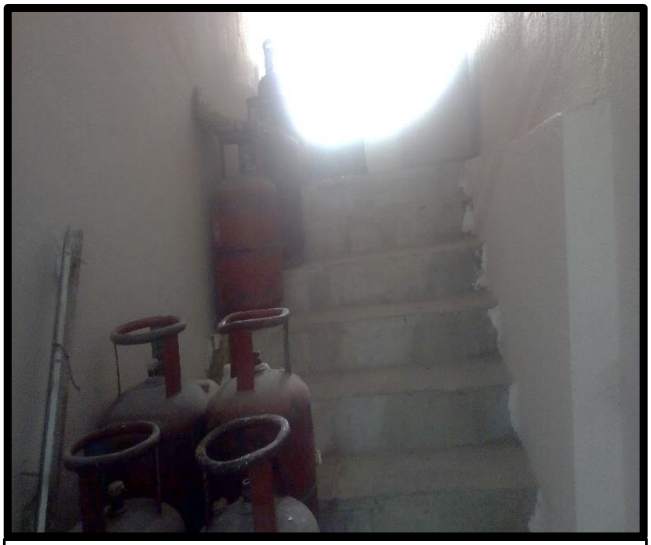
It was observed that:

a) There is wide and easy access to the main building from the main road. Staircase is provided for staff and students.
b) Staircase & corridors have wide windows, which allow sufficient light and ventilation. Staircase are provided with handrails for safety
c) Since the access and staircases are wide and free from clutter, safe evacuation from the building during emergency can be achieved.
d) Fire extinguishers and fire hydrants are provided in a few areas for emergency, but they are not serviced or inspected annually, which will be useful. It was observed that fire extinguisher refills were overdue, this could be a safety issue during emergency.
e) Used LPG cylinders were stacked in staircase of store room II. Dedicated storage area for LPG cylinders needs to be provided to avoid any safety hazard.
f) There is no signage for emergency fire exit. This is of crucial importance during emergency.

Wide Staircase/ handrails for safety

RSM entrance

Fire extinguisher (Overdue)



LPG cylinder storage

3.12 Green belt/ Landscaping:

a) The Institute has a sprawling campus spread over 3 acres.
b) In the periphery of the campus, along the rear and boundary, trees are planted which helps in bring down noise and cut down dust storms. Potted plants are also kept near building entrance and campus building. This plantation also helps in balancing the temperature variation (severe heat and cold).
c) Indoor plants can be potted along the corridors and entrance of the building.

Green belt in main campus premises

Potted plants

3.13 Green Initiatives:

a) Every year the institute publishes college magazine ('Shabdgandh') in which sustainability & environmental practices are highlighted.
b) On July 1, 2016 NSS volunteers were actively involved in Latur tree plantation drive. Around 150 – 200 trees were planted in this drive.
c) On October 2, 2016 NSS volunteers organised a forest trail.
d) NSS volunteers prepared slogan to educate natives of Mauje Wanjarwadi (Tal – Renapur, District – Latur) on water management & sanitation issues from February 23, 2017 to March 1, 2017. The slogan was "Paryavaran – Jalvyavasthapan, swacch bharat sundar bharat".
During camp, following activities were conducted:
- The volunteers were actively involved in cleaning of school campus.
- They have dug 30 – 35 soak pits for sewage disposal.
- Social awareness campaign was conducted.
- With the assistance of forest department and grampanchayat, trees were planted on both sides of the road from Khamgaon pati to Wanjarwadi.
- With help of Wanjarwadi villagers, carried lake restoration activity by removing sediment formed.
- "Vriksh Dindi" (tree procession) was organized.
- For the cause of environment protection and safety, students of RSM organized drive on pollution-free Diwali and Holi.

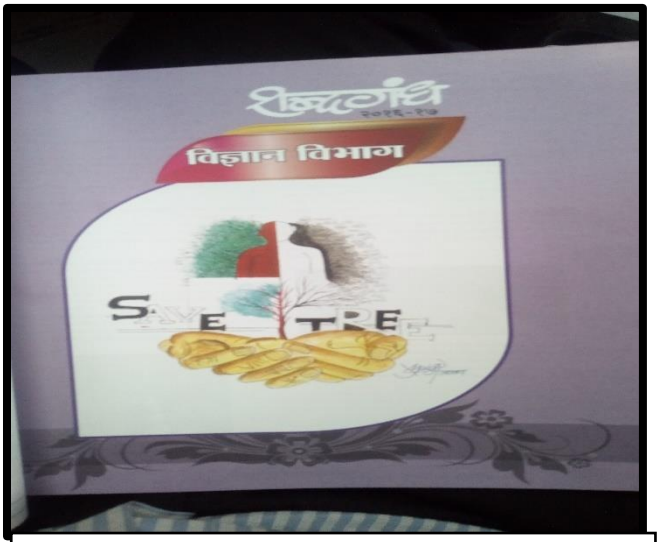
e) Sustainable source such as rain water harvesting is practised in college institute which has helped in replenishing of borewell water.

f) The institute has installed solar panels and solar water heater on terrace of main campus to promote use of renewable energy in FY 2017-2018.

g) Wide range of activities such as student camps, poster competition, film shows, field visit/survey, seminars, projects, environment campaign, water awareness conservation & harvesting, wall poster competition, essay competition are organised to inculcate ecological awareness amongst the students.

h) Car/bike pooling is practised by staff members & students which is a sustainable initiative that reduces air pollution and helps in fuel conservation. Bi-cycles are also used as mode of transport by the staff.

"Shabdgandh" college magazine



"Shabdgandh" college magazine

"Shabdgandh" college magazine

Tree Plantation drive

4. Recommendations/ Suggestions:

4.1 For Improving Energy Consumption:

a) Every classroom and lab with central switch board should have a diagram linking place of tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save unnecessary operation.
b) Installation of automatic lights with sensors can be considered.
c) Standard Operation Procedures (SOP's) should be prepared and followed for green purchasing wherein equipment with star rating; those using eco-friendly materials; those with safe disposal policy or return to supplier after dysfunctioning, can be considered.
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) If possible, 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 electricals when not in use

4.2 Water Conservation:

a) Encourage efficient water use and reporting by installing water meters at key locations. Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
b) Minimize/ reduce water usage by installing water saving faucets such as pressmatic taps, tap aerators, jet sprays etc.
c) Dual flushing system can be installed in toilet which saves considerable amount of water.
d) Sewage Treatment Plant (STP) can be install and treated sewage can be used for flushing in toilets. This will reduce fresh water footprint of RSM.
e) Installation of waterless urinals can be considered to reduce water consumption.
f) Water audit can be conduct and 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.
g) Rain water harvesting pit should be decluttered as construction & demolition waste was observed near pit. Rain water harvesting potential needs to be assess and compare with actual rain water harvested.

4.3 Paper and other Solid Waste Reduction:

a) Inventories of all solid waste generated in the premises must be maintained. The records can be used to evaluate reduction in solid waste generation.
b) There should be waste segregation practices at source by providing separate bins.
c) Adopt recycling methods. This can be done 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 & practised. The SOP's may include collection, segregation and reuse of different

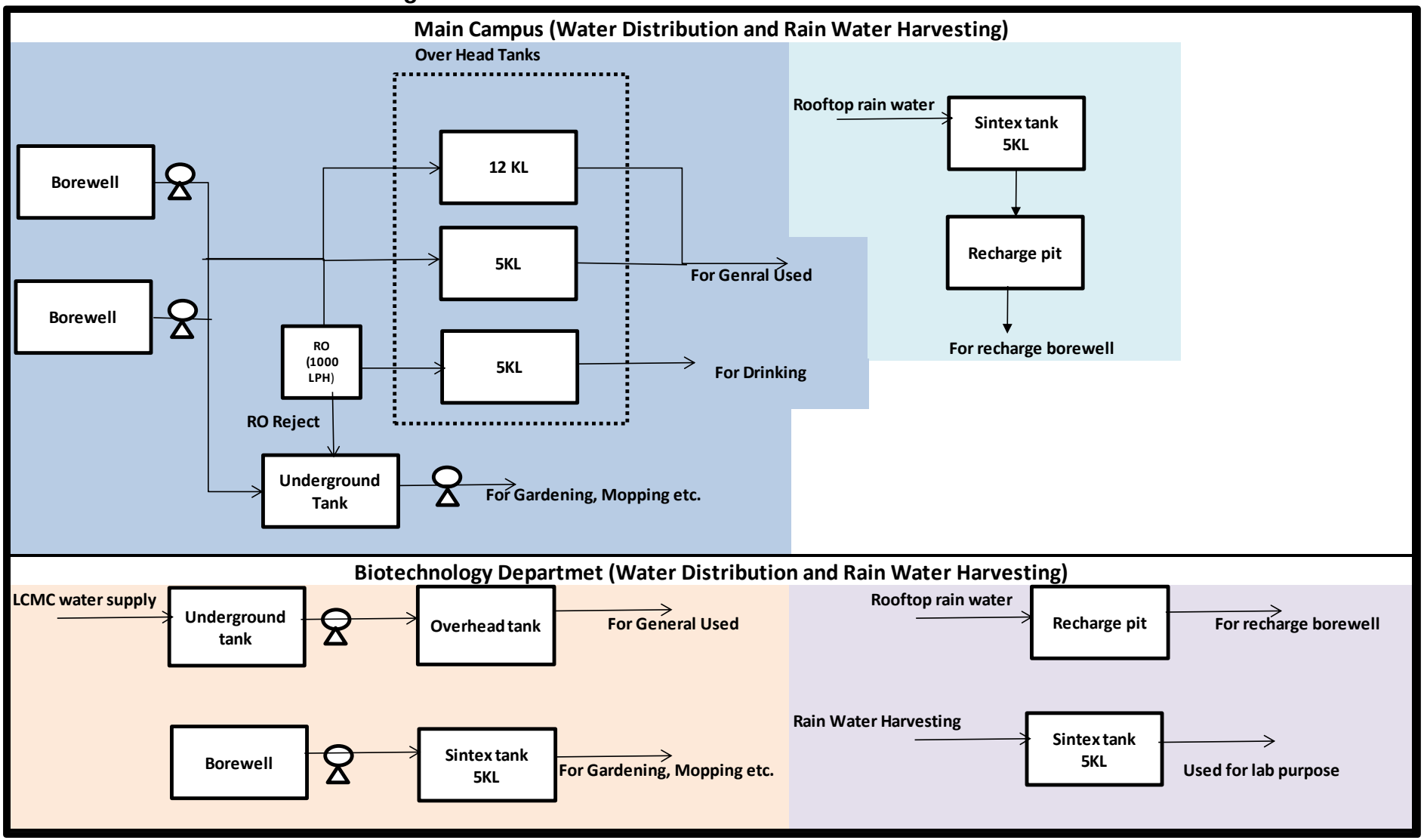
types of wastes, if any (e.g. biodegradable waste for composting). This will help in safe disposal of waste to recycle agencies.

e) Composting of organic waste should be considered.
f) Plastic bottles to be handed over to PET recyclers.
g) The college can introduce online medium/ 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 can be monitored to understand the impact of digitisation in the facility.

4.4 Others:

a) Environmental advisory committee could be formed. The discussions/ information sharing among different departments can generate lot of ideas and awareness on green issues.
b) Maintain minutes of meetings of environmental committee; 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 for correct postures, water & energy conservation, solid waste management 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 decision.
e) Vertical gardening can be done using indoor plants. Hydroponic garden can be an option where in small space plants can be planted. Drip irrigation system can be provided for plants.
f) Indoor air quality can be monitored to ensure safe and healthy environment.
g) For enhancing the scenic beauty, it is suggested to plant flowering trees, which bloom in different seasons, in front of the large trees along the periphery. Vertical Gardening can be done on the compound wall of the institute
h) The trees planted during tree plantation drive must be monitored and taken care of.

Annexure 1: Water Distribution Diagram



Annexure 2: Indoor Gardening Details

Indoor plants are commonly used for their aesthetics benefits but 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 fecal matter particles	Wood, Paper products, Air borne fecal – 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, paneling 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 3: List of Electrical Instruments and Energy Intensive Areas

Sr. No.	Facility	Details of Provisions
1.	Total Classrooms - 5 Nos.	Computers and Projectors
2.	Staff Rooms -2 Nos.	Computers
3	Seminar Halls-7 No.	Seminar Hall
4	Department of Computer Sci.- 5 Labs, one Store and Server room	140 Computers, Server room, AC and Online UPS/ Inverter facility
5	Department of Physics & Electronics- Labs	C.R.O single trace, C.R.O dual trace, Sine square wave generator, sine square series test lab generator, Sine square gen 206, current meter digital multi-range, Radio frequency oscillator, Power supply 0-30 v D.C , Regulated power supply, Dimmerstat, Frequency counter, Multimeter digital, Power supply 0-25 v , V.T.V.M digital, Computer, Printer, Generator, Epidiascope, Spectrometer, Sodium vapour lamps, Mercury vapor lamps, Electrical balance, UV-Vis spectrometer, Keiththely source meter, Digital balance
6	Department of Chemistry	Abbes refractometer, Ultra sonicator, Burner electricals, Karl-Fisher auto-titrator, centrifuge machine, Colorimeter, conductometer, DLP projector, Digital balance, Digital photofluorometer, Distillation plant, Flame photometer, Freezing point apparatus, heating mental, Melting point apparatus, Oven, pH meter, Polarimeter, Potentiometer, refrigerator, Rotary shaker, Turbidity meter, UV chamber.
7	Department of Zoology	Ultra-low deep freezer, Electronic balance, Microscope with attached camera and computerised system for data interpretation and data storage, Blotter.
8	Department of Botany Labs	Autoclave, Incubator, photoelectric colorimeter, Remi centrifuge bench top, Refrigerator, Air drier, Electric balance, Oven, Computer, High speed cooling ultra-centrifuge, Rotary shaker
9	Department of Microbiology Labs	VDRL shaker, Autoclave, Incubator, Photocolorimeter, spectrophotometer, Warming table, Heating mantle, Distillation plant (steel), Slide projector automatic, Hot plate, Laboratory oven, UV chamber, Refrigerator, pH meter, vacuum pump, Pipette washing machine, Digital photoelectric meter, Electronics balance, Homogenater, Drier heavy duty, Vacuum cleaner, Electronic balance, Distillation unit, Godrej refrigerator, Colony counter digital, Orbital shaking incubator with voltage stabilizer, Cooling centrifuge with voltage stabilizer, Deluxe laboratory centrifuge, Laminar air flow microfilter, Lab fermenter,

10	Department of Biotechnology Labs	Microscope Binocular electric, pH electrode, Auto clave, Air conditioner, Cooling centrifuge, Digital Colorimeter, Double beam UV spectrophotometer, Electronic Balance 1 mg, Flame photometer, Heating mantle, Hot plate, Incubator, pH meter, Refrigerator, Vacuum Pump, UPS 800 40 AH Battery, Dot matrix printer, Printer HP inkjet 3940, COD incubator, LCD projector, Computer Monitor & CPU, Balance Adaptor

Annexure 4: Green Audit Checklist

Good Daylight Design & Ventilation

Sr. No.	Design Feature	Status	Remarks (If any)
1	Array of roof apertures	X	
2	Broad door opening	✓	
3	Clerestories (High windows)	✓	
4	Rectangular building so that sunlight can reach all areas	✓	
5	Double or triple glazing on windows/ Sun protecting film on windows	X	
6	Enough illumination from natural light	✓	Few corridors have limited natural light
7	Light coloured fabric curtain or blind for window covering	✓	
8	Operable/ openable windows	✓	
9	Use of glass as facilitator of natural light	✓	
10	High ceiling	✓	
11	Wide corridors	✓	
12	Use of exhaust fans	✓	Only for washrooms and Laboratory, canteen

Water Efficiency & Wastewater Management

Sr. No.	Design Feature	Status	Remarks (If any)
1	Aerators to water taps	X	
2	Automatic toilet faucets	X	
3	Dual flush toilet with cistern	X	
4	Efficient plumbing system from maintenance & operation point	✓	
5	Use of low flow/ flow control water equipment or gadget	X	
6	Water free urinals (No flush urinals/Zero flush urinals/Water less urinals/air based flushing system these save water used in toilet)	X	
7	Drip irrigation (This refers to plant watering system)	X	
8	Water distribution diagram/water network/ Water balance diagram	X	
9	Sewage treatment plant for treated sewage recycle	X	
10	Rainwater harvesting	✓	Rain water harvesting system installed at RSM– Main campus & RSM– Biotechnology department. Sports complex is under construction.
11	Display of signboards at appropriate places for water conservation	X	
12	Use of bore-well water in the toilet for flushing	✓	

Indoor Air Quality

Sr. No.	Design Feature	Status	Remarks (If any)
1	Installation of HVAC	X	
2	Monitoring of HVAC system	X	
3	Maintenance of HVAC system	X	
4	Installation smoke detectors	X	
5	Indoor air quality monitoring	X	
6	Indoor Air Quality (IAQ) awareness programs	X	

Energy Efficiency and On-site Energy Generation Mechanism

Sr. No.	Design Feature	Status	Remarks (If any)
1	Use of natural day light	✓	
2	Use of energy efficient equipment's	✓	Dysfunction old equipment's are replaced with new energy efficient (BEE standard) equipment's
3	Use of energy saving bulbs (LED lights)	✓	Dysfunction conventional tube lights are replaced with new energy efficient LED lights
4	On-site energy generation	✓	Solar power generation system (30 KW) installed.
5	Photocell occupancy sensor for automatic light control	X	
6	Regular maintenance of electrical system	✓	
7	Computerized monitoring of electrical system	X	
8	Solar panel	✓	Solar panels are installed only at RSM – Main campus
9	Display of signboards at appropriate places for energy conservation	X	

Temperature and Acoustic Control

Sr. No.	Design Feature	Status	Remarks (If any)
1	Use of daylight design (Building is constructed in such a way that diffused sunlight allows light but not the heat)	✓	
2	Special walls for temperature control and noise barrier (Thick/ Double/ Composite/ Acoustic control)	X	
3	Earth air tunnel (cools air in summer and heat it in winter)	X	
4	Roof with reflective glass	X	
5	Use of cool roofing material during construction (mineral wool, rock wool, vermiculite, foams, expanded polystyrene, extruded polystyrene etc.)	X	
6	Use of insulation material (e.g. autoclaved aerated blocks, hollow blocks etc.	X	
7	Use of water bodies/fountain	X	

8	Use of landscaping as sound barrier	✓	

Waste Management

Sr. No.	Design Feature	Status	Remarks (If any)
1	Segregation of dry and wet waste	✓	
2	Use of coloured bins with code to collect garbage	X	
3	Setting up recycling area/ composting area	✓	Composting is done only at RSM - Biotechnology department
4	Avoid use of paper by going digital (Paper)	✓	Digitization is in process
5	Printing on both sides of paper	✓	
6	Reuse of printed paper/ envelops for other applications	✓	
7	Donation of books to store or other library	X	Donation of books is practiced internally within students from seniors to juniors
8	Donation of weeded books to needy students	X	
9	Donation of computers to NGO's to refurbish and give it to needy schools/people	X	
10	Creation of specified junctions for collection of E-waste(E-waste)	✓	
11	Implementation of any recycling project or program	X	
12	Purchase of electronic products from company's which have after sales service for the disposal of product with take back policy	X	
13	Reusing waste to produce new sustainable products	X	
14	Hand over to the organization or recycler who knows proper disposal system	✓	

Environmental Audit

Sr. No.	Design Feature	Status	Remarks (If any)
1	Energy audit (includes energy consumption, thermal emission, visual comfort)	✓	Report was not available for review.
2	Fire Safety audit	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	Status	Remarks (If any)
1	Easy access to the main entrance of the building	✓	
2	Provision of Lift/Elevators	✓	Only one lift is installed in RSM – Main campus at A wing.
3	Ramp/ stairs with handrails on at least one side	✓	
4	Restrooms (toilets) in common areas	✓	
5	Uniformity in floor level	✓	

6	Follow standard procedures for commissioning of electrical/ plumbing system	✓	
7	Regular maintenance of building	✓	
8	Use of safer cleaning solutions	✓	
9	Preferred vehicle park spaces for specially abled	X	
10	Visual warning signage in common and exterior areas for safety	X	
11	Availability of wheel chair	✓	

Green Program

Sr. No.	Design Feature	Status	Remarks (If any)
1	Green education to improve environmental awareness	✓	
2	Outreach relationships with local groups interested in environmental concern and satisfy their information needs	✓	
3	Reduce, Reuse and recycle the products such as books, electronic appliances etc. (e.g. At the time of de-selection and disposal of library material)	✓	
4	Digitization of majority of processes	✓	
5	E-archiving	✓	
6	E-resources: E books, Online Journals, membership of consortium	✓	
7	Subscription to databases	✓	
8	Contribute library information on sustainability resources to a institute publication, blog or website	X	
9	Selection of material content of which informs and assesses green practices (green computing, energy conservation etc.)	X	
10	Use of eco-friendly reading material	X	
11	Creation of “Green Team” in the institution	X	
12	Recycling beyond paper i.e. Plastic, e-waste	X	
13	Disseminating expert advice about sustainability to other colleges to make their own college greener	X	
14	E Publishing reviews of new green resources in the newsletter or news	✓	