

GREEN AUDIT

STUDY PERIOD (ONE YEAR) 2022 – 2023

Sustainability study

RENEWAL AUDIT REPORT

Studied for

Shreyash Pratishthan

Satara Parisar, Beed By-Pass Road,
Aurangabad – 431010, India

Studied in the capacity of

Accredited and Certified
Green Building Professional



Studied by

Greenvio
Solutions

Website: <https://thegreenviosolutions.co.in/>

Email: greenviosolutions@gmail.com

Valid till **31 May 2024**

Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla
 Accredited & Certified Green Building Professional, ISO IA (IMS)
 Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit

Institute: Shreeyash Pratishthan Date: 28.8.2023

Document objective: Inferences of the Site visit

Observations (Positive aspects)	Suggestions (Improvement aspects)
Green Audit	
- Water management facilities & measures are adopted	- Waste management needs to be improved
Energy Audit	
- Needs improvement	- Smart systems can be adopted
Environment Audit	
- Green cover has improved - Ecological spaces have been developed. [Bird sanctuary]	- Documentation of reflectance.



Signature & round seal

Name: Col Joy Daniel (Retd)
 Designation: CEO

For the said Institute



Signature & round seal

Name: Mrs. F. R. Shaikh
 Designation: Project Coordinator

For The Greenvio Solutions



Disclaimer

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The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National and International Standards; the report has been generated based on a comparative analysis of the existing facilities and the prerequisites formulated by various standards. The inputs derived are a result of the inspection and research. These will further enhance and develop a Healthy and Sustainable Institution.

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The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm with the Project Head - Ar. Nahida Shaikh who is an Accredited and Certified Green Building Professional. Green Building consultancy is her forte and she is one of the most sought-after names when it comes to providing excellent quality services within the stipulated time frame.

The Study is conducted incapacity of an Accredited & Certified Green Building Professional with extensive experience.

Greenvio Solutions

Developing Healthy and Sustainable Environments

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

Palghar District, Maharashtra- 401208

sustainableacademe@gmail.com

Acknowledgment

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Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

RENEWAL REPORT

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RENEWAL REPORT

1. Introduction

1.1 About the Institution

Shreeyash Technical Campus established under **Shreeyash Pratishthan** is situated in the midst of nature, surrounded by the hills, it is Marathwada's one of the most promising educational campus.

It was established in 2008 as a dream project of its chairman, Er. Basawaraj Mangrule, himself an engineer from Government Institute of Engineering, Aurangabad. The Campus has undertaken responsibility of providing quality education to the students of Marathwada.

Going beyond its motto of **"Transforming Students into Professionals"**, Shreeyash Technical Campus in a short span of time has played a significant role in bridging the gap between the demand and supply of the industrial zone of Aurangabad. It houses the following Institutes in its campus spread over a land of 26.78 acres

- Shreeyash College of Engineering and technology
- Shreeyash College of polytechnic
- Shreeyash Institute of Pharmaceutical education and Research
- Shreeyash Institute of Pharmacy
- Shreeyash Institute of Management studies and Research
- Shreeyash Ayurvedic College & Hospital Research center

1.4 Assessment of the Institute

The Institutes in the Campus have received the following:

- NAAC Accreditation
- NBA Accreditation
- ISO Certification
- AICTE, DTE and PCI approval
- University Affiliation

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5.	Dr. Mangesh S. Ghoshale	Internal	Asst. Prof. & coordinator	
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 Designation: **CEO**
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2. Documentation

The compliance study was carried out through investigative ways. This was done to understand the **extent of suggestions and their implementations based on previous report of Academic year 2021-2022**. Certain aspects noted below in red font should be upgraded as per the convenience of the team, these are common to the site and can be considered for entire premises wherever there are similar areas.

A site visit was conducted on **Monday, 28 August 2023** observations as follows noted.

The current audit is for academic year 2022-2023.

The following points were observed during the investigation and are documented for being **'POSITIVE ASPECTS'** that are beneficial to the stakeholder and the campus.

Actual positive points

The following points are based on the site visit observations:

- Medicinal garden
- Herbal garden
- Bird sanctuary
- Courtyards spaces beautified
- Rainwater harvesting areas documented
- Scheme documents
- Civil and fabrication work for areas in basement of Engineering and polytechnic block
- Dedicated plastic free zone
- Extensive fire and life safety measures
- Appropriate waste management facilities

3. Suggestion

3.1 General suggestions

The following suggestions are to be considered as a **first priority** and should be implemented **within 1.5 to 2.5 years from the date of the Report submission.**

➔ Water tanks in all areas

- Include the information about size, capacity and usage
- Paint the tank in light blue colour
- Add signboards about the usage such as 'Drinking' or 'Secondary'
- Add signboard and map about the process/ system in practice

➔ General aspects (Indoors areas)

- Zoning of the site w.r.t. space wise analysis
- Signboards, signages, information and display boards at relevant locations.

➔ Library in the Campus

- Include silence board at various locations and at entrance.
- Install book drop box system at the entrance of the library.
- Upgrade smart scanning system for every book
- Include a self service station for digitalization.

6.2 Section-wise suggestions based on general study

The following points are related to 'entire Institute' and should be considered as **second priority** once the general suggestions are executed. These should be implemented within 3.5 to 5.5 years from date of the Report submission.

6.2.1 Green practices Audit

- ➔ **Increase the green awareness practice** – This should be in terms of the physical and virtual events which will be beneficial for all stakeholders in the shared premises. (Basically the frequency of the lectures should be increased)
- ➔ **Increase the organic farming practices** - The premises can have an organic farming facility in terms of farms, kitchen, terrace gardens the produce can be directly utilised in the premises.
- ➔ **Forest zone/ Green zone** – The Institute can explore the opportunity to develop mini forest in an area of 50 – 100 sq. m (8m x 8m or 10m x 10m) and use creative and low-cost techniques for example Miyawaki by engaging the students, staff members to develop exotic and local plantations. This area could be demarcated as 'Green zone' and the documentation of the same can be carried frequently.

6.2.2 Waste Audit

- ➔ **Twin Dual Litter Dustbin Bins** - There should be more number of dual litter dustbins at various locations in areas such as Canteen, and open spaces. This would inculcate the awareness of waste segregation among students.
- ➔ Tie up with **Bisleri International** regarding their '**Bottles for change program**' also with '**Thereco**' for their waste management.
- ➔ Invite companies such as '**Thaely**' and '**Recharkha**' to undertake skill development workshops.

6.2.3 Water Audit

- ➔ **Rain water bunds** – There should be landscape beautification project undertaken to appropriate channelize the rain water through bunds and similar facilities.

6.2.4 Health and Hygiene Audit

- **Courtyards and duct areas** – These are located in the internal and setback should have vertical gardens for beautification.
- **Avoid burning waste** - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff
- **Pest control program** - The Institute should practice pest control programs with appropriate sanitation facilities through an appropriate agency.
- **Designated staff for maintenance** - There should be a designated Hygiene specialist and Maintenance staff who can keep a regular check on the operation and maintenance of the toilet areas and the equipment, lights, and all facilities.
- **Signboards** – The Institute should have multiple signboards about 'No smoking' and 'Healthy premises' at every nook and corner of the Institute.
- **Compound wall** – The compound wall should have awareness messages about 'No Smoking' and 'No Tobacco'
- **Toilet hygiene** – There should be facilities such as potpourri, camphor tablets in the toilet to avoid smell and health related issues.

On-site investigation and physical verification
 Audit Team during the visit and other photos collected during data documentation



PASS Board, concealed wiring system



Waste management and dedicated fire system

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Meeting and group photo with the core team

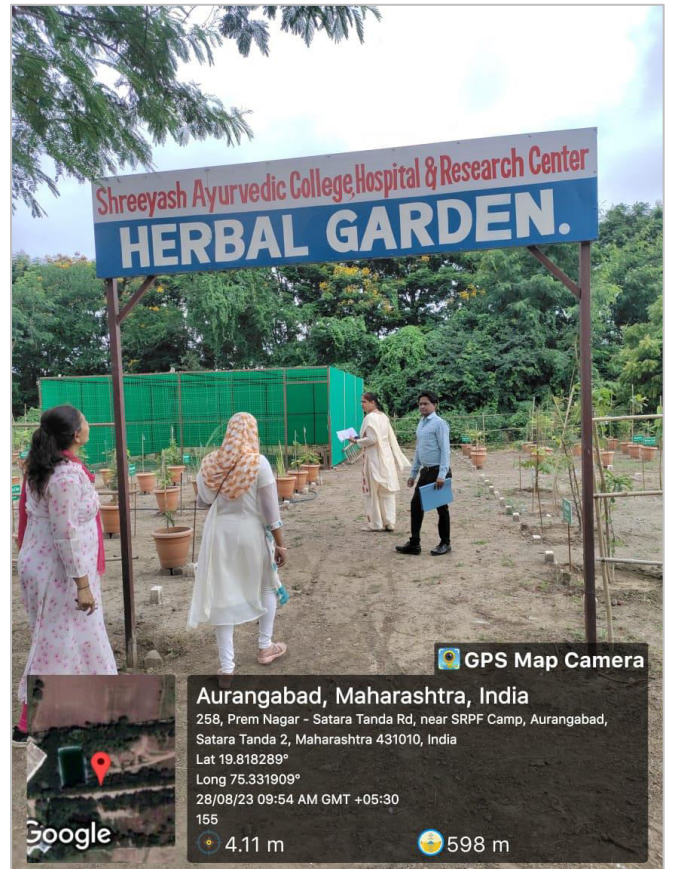


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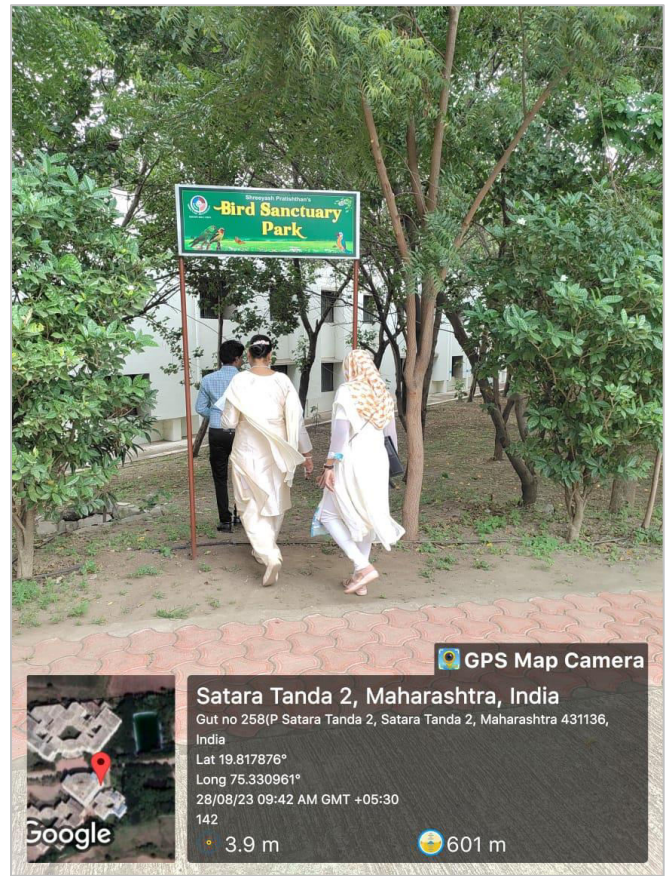


Investigation of the breakout zones and the nomenclature of the plantations



Investigation of the plastic free zone and the herbal garden

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Investigation of the bird sanctuary



Investigation of the plastic free zone and the herbal garden

4. Compilation

The study is based on the data collected, analyzed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyze and study the data collected.

- ➔ Uniform Plumbing Code – India, 2008
- ➔ IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- ➔ IGBC Green Landscape Rating system, March 2013
- ➔ BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST – Canada
- ➔ Used only for understanding Universal design - Universal Accessibility Guidelines for Pedestrian, Non-motorized vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National center for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation and www.umassd.edu
- ➔ The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- ➔ Images on site by Coordinators of the both teams
- ➔ Icon images used by <https://www.vecteezy.com/free-vector/security-camera-icon> and <https://www.vecteezy.com/free-vector/electric-car-icon>

ENVIRONMENT AUDIT

STUDY PERIOD (ONE YEAR) 2022 – 2023

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For the said Institute



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The current audit is for academic year 2022-2023.

The following points were observed during the investigation and are documented for being 'POSITIVE ASPECTS' that are beneficial to the stakeholder and the campus.

Actual positive points

The following points are based on the site visit observations:

➤ **The Institute is designed amidst a lush green campus; as soon as one enters the campus, the sight of trees lined all along the entrance road is very soothing, calming and mesmerizing. The campus is full of fresh air thanks to the flora and fauna.**

- Good infrastructure with rich academic knowledge imparted to the stakeholders.
- Plants on both sides of road, greenery at every open ground, Institute trying to cover most of premise with plant as they can.
- Less noise pollution and silent as compared with the outside areas and helps to concentrate on studies highlighting the calm atmosphere.

➤ **Many types of birds and plantations have made the environment pleasant; this is a notable feature. It is beautiful green campus and stakeholders can view unique types of flora, listen the sweet voice of birds everyday which builds positivity.**

- Automatic water supply implementation for purpose of trees growth; Care of existing trees and plants are taken quite well and entire campus is literally 24 hours clean!!

➔ **Streetscape features such as:**

- Dedicated paved walkway
- Outdoor landscape lights
- Softscape – Hardscape – Xeriscaping and well planned landscape pockets
- Speed breakers and zebra crossing
- Seating area as breakout zones
- Open grounds
- Recreational spaces with outdoor game facilities
- Plantation with numbering of the trees etc.
- Pocket landscape at every nook and corner of the site

RENEWAL REPORT

3. Suggestion

3.1 General suggestions

The following suggestions are to be considered as a **first priority** and should be implemented **within 1.5 to 2.5 years from the date of the Report submission.**

➔ Extra care for the rooftop areas

- Introduce the signboards about 'No students are allowed to enter this area'
- Upgrade the space as cool roof by painting it with cooltop material.
- Undertake feasibility study of before and after temperature reading.
- Take precautions to keep terrace areas free of any kind of storage materials

➔ Messages on the beam area

- Include quotes and messages from eminent personalities all over the premises on beam for inspiration and beautification.

➔ General aspects

- Development of breakout zones at relevant locations
- Introduce zone wise details at relevant locations
- Develop plantations around the vertical garden areas
- Placards and manuals for awareness

➔ Streetscape features

- Speed limit signage
- Speed breakers
- Parking mirror
- Bollards with lighting for safety and landscape
- No parking signboards at dedicated locations
- Direction sign board
- Post box
- Suggestion box
- Vertical plantations (potted) to beautify blank spaces
- Signboard about specific space
- Signboard about the various blocks

6.2 Section-wise suggestions based on general study

The following points are related to 'entire Institute' and should be considered as **second priority** once the general suggestions are executed. These should be implemented **within 3.5 to 5.5 years from date of the Report submission.**

6.2.1 Site beautification

Bird house/ Feeders - At appropriate locations there can be provisions for drinking water and some grains for birds as they visit the site much frequently.

6.2.2 Heat island reduction

Since the campus is a lush green site with innumerable green cover, the suggestions for this section are excluded.

6.2.3 Life safety

- **Combustible equipment** - Every space which has a gas cylinder or combustible equipment should have a provision for the barricade around the gas cylinders, appropriate safety board's mentioning 'danger sign' and 'Do not touch' with an additional small fire extinguisher close by.
- **Sensitization programs** - Regular seminars/ webinars by experts such as Architects, Govt. Fire department on subjects related to fire and life safety should be organized and the outputs should be adopted and documented.

6.2.4 Pollution Control

- **Specific area designated for E-vehicles** – There should be designated area dedicated to E-vehicles parking and charging and this zone should be demarcated as 'Eco-Zone'
- **Promote the use of Eco-friendly vehicles** - There can be student and staff sensitization program on eco-friendly and battery-operated vehicles/ low emission vehicles for daily use.
- **Battery charging points for Eco-friendly vehicles** - There can be provision for battery charge points, this would inspire students to change their mode of transportation and adopt sustainable practices.
- **Bicycles as a gift** - As an appreciation gesture maybe the student's toppers/ staff best performers can be awarded a bicycle occasionally.

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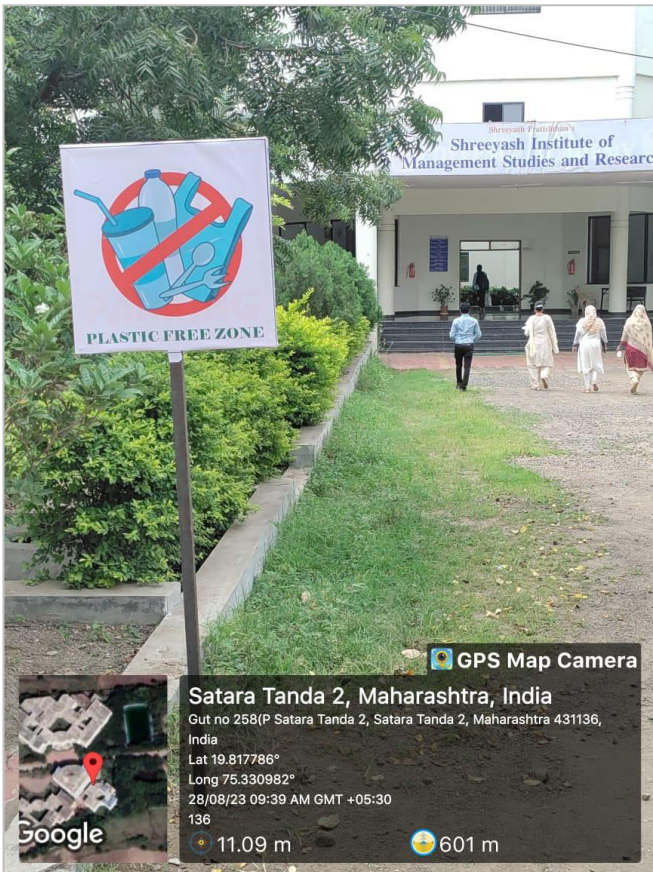


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- ➔ IGBC Green Landscape Rating system, March 2013

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- ➔ The city of Cheyenne, Streetscape/ Urban Design elements - Wyoming Planning Association, Gillette, Wyoming, United States
- ➔ Streetscape elements – Chapter 6 on San Francisco
- ➔ American lung association <https://www.lung.org/>
- ➔ Study related to air pollution <https://www.airgle.com/>
- ➔ Exploring the light pollution <https://education.nationalgeographic.org/>
- ➔ Accessibility study <https://www.washington.edu/>
- ➔ Urban heat island effect <https://www.epa.gov/heatislands/what-you-can-do-reduce-heat-islands>

ENERGY AUDIT

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1. Introduction

1.1 About the Institution

Shreeyash Technical Campus established under **Shreeyash Pratishthan** is situated in the midst of nature, surrounded by the hills, it is Marathwada's one of the most promising educational campus.

It was established in 2008 as a dream project of its chairman, Er. Basawaraj Mangrule, himself an engineer from Government Institute of Engineering, Aurangabad. The Campus has undertaken responsibility of providing quality education to the students of Marathwada.

Going beyond its motto of **"Transforming Students into Professionals"**, Shreeyash Technical Campus in a short span of time has played a significant role in bridging the gap between the demand and supply of the industrial zone of Aurangabad. It houses the following Institutes in its campus spread over a land of 26.78 acres

- Shreeyash College of Engineering and technology
- Shreeyash College of polytechnic
- Shreeyash Institute of Pharmaceutical education and Research
- Shreeyash Institute of Pharmacy
- Shreeyash Institute of Management studies and Research
- Shreeyash Ayurvedic College & Hospital Research center

1.4 Assessment of the Institute

The Institutes in the Campus have received the following:

- NAAC Accreditation
- NBA Accreditation
- ISO Certification
- AICTE, DTE and PCI approval
- University Affiliation

Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla
 Accredited & Certified Green Building Professional, ISO 1A (IMS)
 Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit

Shreeyash Pratishthan

Institute: _____ Date: _____

Document objective: Exit Meeting attendance sheet

S. No.	Name	Committee	Designation	Signature
1.	Mrs. F. A. Shaikh	External	Project Coordinator	
2.	Ar. Nahida Abdulla	External	Project Head	
3.	Dr. Masarat Sultan	Internal	Professor & Coordinator	
4.	Ms. Bhagyashali Pawar	Internal	Principal (SYIP) D-Phas m	
5.	Dr. Mangesh S. Ghoshale	Internal	Asst. Prof. & coordinator	
6.	Mr. Vivek M. Thorat	Internal	Assistant professor	



Signature & round seal
 Name: _____
 Designation: **CEO**
 For the said Institute



Signature & round seal
 Name: Mrs. F. A. Shaikh
 Designation: Project Coordinator
For The Greenvio Solutions



2. Documentation

The compliance study was carried out through investigative ways. This was done to understand the **extent of suggestions and their implementations based on previous report of Academic year 2021-2022**. Certain aspects noted below in red font should be upgraded as per the convenience of the team, these are common to the site and can be considered for entire premises wherever there are similar areas.

A site visit was conducted on **Monday, 28 August 2023** observations as follows noted. **The current audit is for academic year 2022-2023.**

2.1 Compliance status

S. No.	Recommendation Title	Compliance Status
1.	Electromechanical systems - Electrical and Lighting	Partially implemented
2.	Building management systems	Not an immediate requirement for implementation, however it can be undertaken in next few years
3.	Facility management controls	

Table 1: Details of the compliance study

2.2 Alternate sources of energy consumption status

As per investigation of the systems, we confirm the availability of the solar panels.

2.3 Comparison study status

The information for the electrical appliances is documented below:

S. No.	Name of the institution	Location
1.	Shreeyash College of Engineering and technology	Both in one building
2.	Shreeyash College of Polytechnic	
3.	Shreeyash Institute of Pharmaceutical education and Research	Both in one building
4.	Shreeyash Institute of Pharmacy	
5.	Shreeyash Institute of Management studies and Research	Separate building
6.	Shreeyash Ayurvedic College & Hospital Research center	Separate building

Table 2: Details of the Institute in the Campus

2.4 Actual Electrical Consumption as per Bills

The details are documented below:

S. No.	Month	Year	Amount	(A) Total units consumed	(B) Solar units generated	(C = A-B) Gross units consumed after deduction
1	June	2022	2,94,787	25,091	4,009	21,082
2	July	2022	2,40,744	17,939	3,554	14,385
3	August	2022	4,78,000	19,142	3,394	15,748
4	September	2022	2,01,367	18,189	3,394	14,795
5	October	2022	1,90,739	15,880	3,995	11,885
6	November	2022	1,80,939	17,876	4,928	12,948
7	December	2022	2,35,504	20,758	3,346	17,412
8	January	2023	2,20,309	19,108	3,557	15,551
9	February	2023	2,14,122	20,571	4,470	16,101
10	March	2023	2,89,195	24,727	5,061	19,666
11	April	2023	3,82,408	25,797	4,313	21,484
12	May	2023	4,21,150	29,430	4,313	25,117

Table 3: Electrical analysis for Polytechnic and Engineering Blocks

S. No.	Month	Year	Amount	(A) Total units consumed	(B) Solar units generated	(C = A-B) Gross units consumed after deduction
1	June	2022	2,94,787	21,123	4,009	17,114
2	July	2022	2,40,744	17,939	3,554	14,385
3	August	2022	2,30,557	15,892	3,394	12,498
4	September	2022	2,01,367	14,937	3,394	11,543
5	October	2022	1,90,739	13,127	3,995	9,132
6	November	2022	1,80,939	13,113	4,928	8,185
7	December	2022	2,35,504	17,446	3,346	14,100
8	January	2023	2,20,309	15,608	3,557	12,051
9	February	2023	2,14,122	16,141	4,470	11,671
10	March	2023	2,89,195	19,755	5,061	14,694
11	April	2023	3,82,408	23,665	4,313	19,352
12	May	2023	4,21,150	27,398	4,313	23,085

Table 4: Electrical analysis for Pharmaceutical education & Research and Pharmacy Blocks

2.5 Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff.

The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, air conditioner, and equipment. The inventory and data collection for sources of energy consumed in the premise is summarised in the following sections.

The following documentation is based on the consumption practice of the premises on a regular working day.

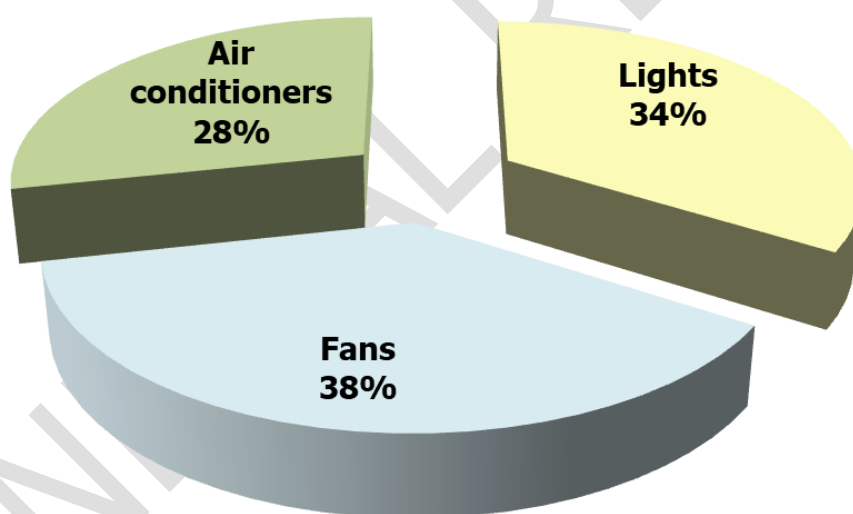


Figure 1: Summary of the calculated electrical consumption as per inventory

The above graph shows that fans consume 38% whereas the lights consume 34% while the air conditioners consume 28% of the total calculated electrical energy.

For study purposes the site is divided into 4 blocks as follows:

- ➔ **Block A** – Engineering and Polytechnic
- ➔ **Block B** - Pharmaceutical education & Research and Pharmacy
- ➔ **Block C** - Management studies and Research
- ➔ **Block D** - Ayurvedic College & Hospital Research center

2.6 Lights

2.7.1 Individual block-wise study

Block A – Engineering and Polytechnic

S. No.	Lights types	kWh (power)	Lights Nos.
1	CFL (<i>Non-energy efficient lights</i>)	209	11
2	LED (<i>Energy efficient lights</i>)	28,504	632
Total		28,713	643

Table 5: Lights study of Block A – Engineering and Polytechnic

Block B - Pharmaceutical education & Research & Pharmacy

There are 201 LED lights consuming 5,095 kWh of energy.

Block C - Management studies and Research

S. No.	Lights types	kWh (power)	Lights Nos.
1	CFL (<i>Non-energy efficient lights</i>)	811	20
2	LED (<i>Energy efficient lights</i>)	3,853	152
Total		4,664	172

Table 6: Lights study of Block C – Management studies and Research

Block D - Ayurvedic College & Hospital Research center

There are 825 LED lights consuming 20,038 kWh of energy.

2.7.2 CFL lights

Since, CFL lights that are non-energy efficient are supposed to be replaced; they are available in 31 nos. consuming 1,020 kWh of energy.

Note: The total energy consumption of all lights (mounted etc. combined) stands at 58,510 kWh

2.7 Fans

2.7.1 Individual block-wise study

Block A – Engineering and Polytechnic

S. No.	Fan types	kWh (power)	Fan Nos.
1	Ceiling Fans	20,936	409
2	Small motor exhaust fan	2,008	34
3	Large motor exhaust fans	106	01
4	Wall mounted fans	87	02
Total		23,137	446

Table 7: Fan study of Block A – Engineering and Polytechnic

Block B - Pharmaceutical education & Research & Pharmacy

S. No.	Fan types	kWh (power)	Fan Nos.
1	Ceiling fans	9,623	188
2	Small motor exhaust fans	768	13
Total		10,391	201

Table 8: Fan study of Block B – Pharmaceutical education & Research & Pharmacy

Block C - Management studies and Research

S. No.	Fan types	kWh (power)	Fan Nos.
1	Ceiling fans	3,993	78
2	Small motor exhaust fans	579	07
Total		4,571	85

Table 9: Fan study of Block C – Management studies and Research

Block D - Ayurvedic College & Hospital Research center

S. No.	Fan types	kWh (power)	Fan Nos.
1	Ceiling fans	18,530	362
2	Small motor exhaust fans	8,434	102
Total		26,964	464

Table 10: Fan study of Block D – Ayurvedic College & Hospital Research center

2.7.2 Types of ceiling fans based on the numbers

Since, ceiling fans are the only types of fans that are available in energy efficient appliance form in the market; the following study is for the same. There are a total of **1,037 Ceiling fans** on the premises as follows:

S. No.	Block	Nos.	kWh (power)
1.	Block A – Engineering and Polytechnic	409	20,936
2.	Block B - Pharmaceutical education & Research & Pharmacy	188	9,623
3.	Block C - Management studies and Research	78	3,993
4.	Block D - Ayurvedic College & Hospital Research center	362	18,530

Table 11: Summary of the ceiling fans in the premises

2.7.3 Types of fans based on the power consumption

The energy consumption of ceiling fans is **53,082 kWh** of the energy.

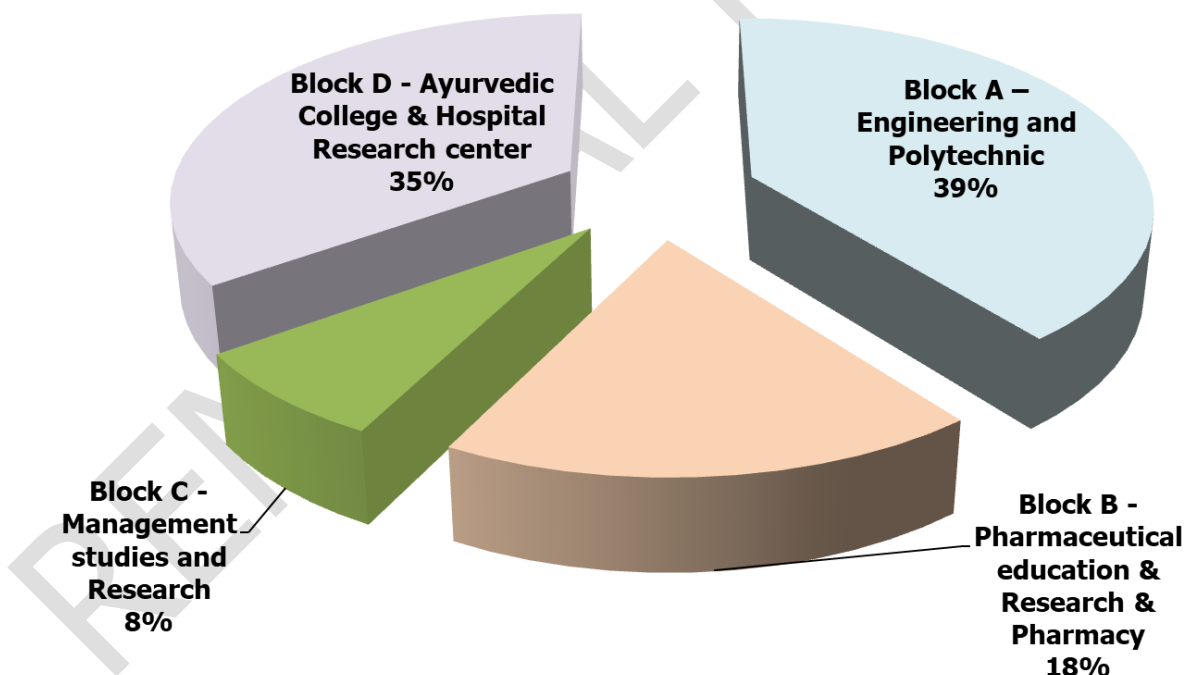


Figure 2: Types of ceiling fans based on power consumption

The maximum energy is consumed by Block A – Engineering and Polytechnic.

Note: The total energy consumption of all fans (Ceiling, exhaust, wall mounted etc. combined) stands at 65,063 kWh

2.8 Air conditioners

2.8.1 Types of air conditioners based on the numbers

There are **31 nos. of air conditioners** on the entire premises.

S. No.	Block	Nos.	kWh (power)
5.	Block A – Engineering and Polytechnic	09	14,208
6.	Block B - Pharmaceutical education & Research & Pharmacy	04	6,315
7.	Block C - Management studies and Research	00	0
8.	Block D - Ayurvedic College & Hospital Research center	18	28,416

Table 12: Air conditioning study at Shreeyash Prathisthan Campus

2.8.2 Building-wise consumption analysis

The energy consumption of air conditioners is **48,939 kWh** of energy.

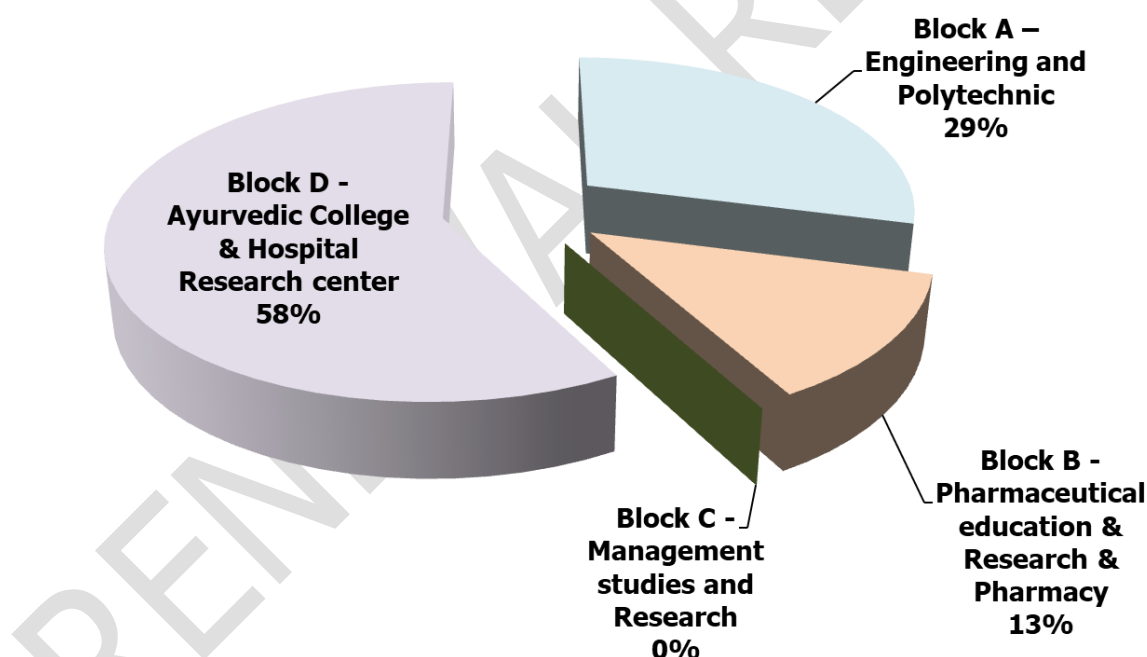


Figure 3: energy consumption of air conditioners based on power consumption

The maximum energy is consumed by Block D – Ayurvedic College & Hospital R.C.

2.8.3 About the replacement of current air conditioners

The current air conditioners are well maintained. There is not an immediate requirement for replacement. Whenever Institute undergoes redevelopment there can replacement with energy-efficient appliances or new air conditioners that require less power consumption.

3. Suggestion

3.1 General suggestions

The following suggestions are to be considered as a **first priority** and should be implemented within 1.5 to 2.5 years from the date of the Report submission.

➔ Earth pit zones

- Add signboard about 'Outdoor Electrical area'
- Code the earthing pits in the courtyard.

➔ General safety aspects

- Rubber flooring in the laboratories to avoid an electric shock.
- Introduce 'PASS' information board about how to use Fire extinguisher and 'FIRE ZONE' display board where safety equipments are kept.

➔ DG and Transformer area

- Add safety signages such as 'Danger-do not touch' etc.
- Add signboards about the usage such as 'Transformer areas' and 'Diesel Generator area' etc.
- Every user in this space should compulsorily wear jacket, helmet, gloves, boots while working and being a part of this space.
- Code the earthing pits in the courtyard.
- Add additional fire extinguishers

6.2 Section-wise suggestions based on general study

The following points are related to 'entire Institute' and should be considered as **second priority** once the general suggestions are executed. These should be implemented **within 3.5 to 5.5 years from date of the Report submission.**

4.1 Alternatives to increase renewable energy

4.1.1 Solar farms

This option can be explored with due discussion with the surrounding and adjacent farmland owners. This will serve as a noble project and will provide dual benefits to farm land and University w.r.t to electricity bill power reduction.



Plate 1: Solar farm concept for the Institute (For reference purpose only)

Source: Image by Zsuzsa Bóka from Pixabay

4.1.2 Solar tree

Since there is availability of space; the solar trees can be installed in multiple places as they will provide dual benefits of aesthetic and energy reduction.



Plate 2: Solar tree concept for the Institute (For reference purpose only)

Source: Image by <https://timesofindia.indiatimes.com/india/cmeri-installed-the-worlds-largest-solar-tree-at-durgapur/articleshow/77856790.cms>

4.1.3 Solar parking

The University can turn its existing parking areas into solar panel powered parking areas. This will provide shade and renewable energy benefit to the University.



Plate 3: Solar parking concept for the Institute (For reference purpose only)

Source: Image by <https://solarpowerproject.in/solar-panels-for-parking-lots.php>

4.2 Smart gardening

The Institute can undertake a Smart Gardening system using IoT Technology.

This will result in saving time by scheduling time for watering; saving money through automated water schedules tracking dampness of soil to know when, how much water garden needs.



Plate 4: Solar farm concept for the Institute (For reference purpose only)

Image source: <https://housing.com/news/smart-gardening/>

Data source: <https://www.happysprout.com/inspiration/what-is-smart-gardening/>

RENEW

On-site investigation and physical verification
 Audit Team during the visit and other photos collected during data documentation



PASS Board, concealed wiring system



Waste management and dedicated fire system

On-site investigation and physical verification
Audit Team during the visit and other photos collected during data documentation



Meeting and group photo with the core team

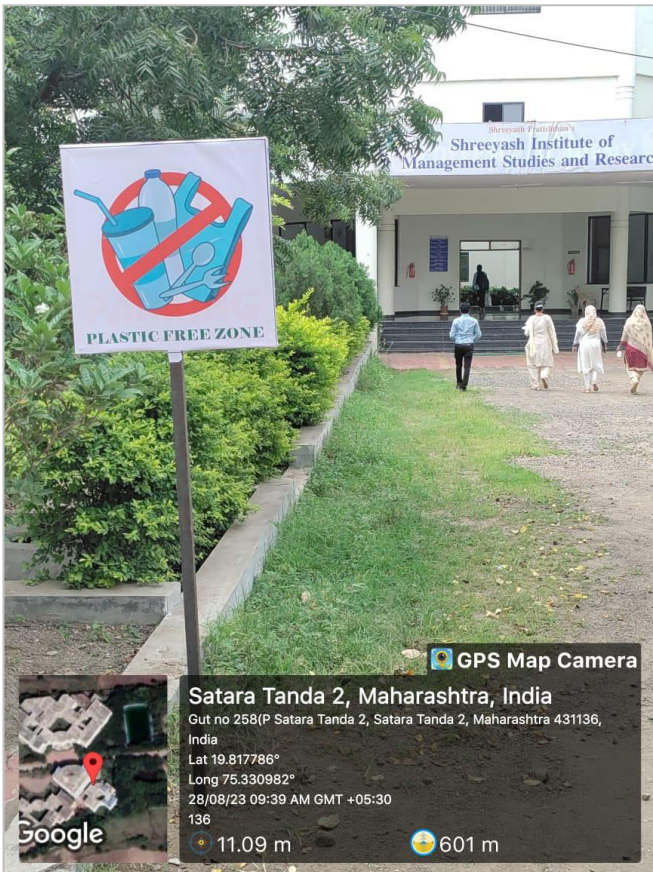


Investigation of the life and fire system

On-site investigation and physical verification
 Audit Team during the visit and other photos collected during data documentation



Investigation of the breakout zones and the nomenclature of the plantations



Investigation of the plastic free zone and the herbal garden

On-site investigation and physical verification
 Audit Team during the visit and other photos collected during data documentation



Investigation of the bird sanctuary



Investigation of the plastic free zone and the herbal garden

4. Compilation

The study is based on the data collected, analysed, rechecked, and confirmed through multiple modes. For the quality study, some standards/ notes have been referred to. These are listed and noted below. However, no direct references have been used anywhere. These are used as a base to analyse and study the data collected.

Specific references for study related to energy

- ➔ <https://www.energy.gov/eere/buildings/zero-energy-buildings>
- ➔ <https://www.dsaarch.com/zero-net-positive-energy>
- ➔ U.S. Energy Information Administration

RENEWAL REPORT

