

Green Audit Certificate (34 per Green Building Parameters)

The study is conducted as per Indian and International Green Building Standards Initiated in the capacity of an Accredited & Certified Green Building Professional

It is awarded for **2021-2022 and 2022-2023** to the Esteemed Institution

(Analysed for 2 years and extended validity for 1 year, thus total 3 years)

Navnirman Shikshan Sanstha's

S. P. Hegshetye College of Arts, Commerce & Science

S. M. Joshi Vidyaniketan, P63, MIDC,
Mirjole, Ratnagiri – 415639

As part of the Institution's initiatives for a Healthy & Sustainable Institute the audit was conducted.
We appreciate the immense efforts taken by Staff and students towards the Efficient Management of Premise.

Valid till **30 September 2024**

Ar. Nahida Abdulla Shaikh

"Elite 100 Green Architects of India" Ecoraur, 2022

Certified Green Building Professional (Registration No. 221718)

Project Head and Green Building Professional-Consultant

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[Signature]

I/c Principal

S. P. Hegshetye College of
Arts, Commerce & Science,
Ratnagiri - 415 639

GREEN AUDIT

STUDY PERIOD (TWO YEARS) 2021 – 2022 & 2022 – 2023

Sustainability study
AUDIT REPORT

Studied for
Navnitman Shikshan Sanstha's
S. P. Hegshetye
College of Arts, Commerce & Science

S. M. Joshi Vidyaniketan, P63, MIDC,
Mirjole, Ratnagiri – 415639

Studied in the capacity of

Accredited and Certified

Green Building Professional



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Disclaimer

The Audit Team has prepared this report for the **Navnirman Shikshan Sanstha's S. P. Hegshetye College of Arts, Commerce & Science** located at S. M. Joshi Vidyaniketan, P63, MIDC, Mirjole, Ratnagiri - 415639 based on input data submitted by the Institute analysed by the team to the best of their abilities.

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 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 as an Accredited and Certified Green Building Professional-Architect. 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.

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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

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Acknowledgement

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Sustainable Academe

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1. Introduction

1.1 About the Management

Navnirman Shikshan Sanstha has been established with a noble cause of imparting higher education among the youth of Kokan region and with a strong belief of serving the society and improving the quality of life of the rural youth in particular.

The Sanstha plans to open a chain of centers of higher learning throughout Maharashtra State especially for the benefit and upliftment of the under privileged class of the society.

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Apart from the above most of the office bearers of the Sanstha have long association with this social movement.

1.2 Assessment of the Institute



1.2.1 Affiliation

The College is affiliated with the **University of Mumbai**, a public state university in Mumbai. It is one of the largest university systems in the world with over 549,000 students on its campuses and affiliated colleges.

1.2.2 Certification

The College has received the code under **All India Survey of Higher Education (AISHE)** wherein the code is C-34050.

1.3 Statements of the Institution

1.3.1 Vision

The Institute proposes

- To provide quality education at affordable cost with special focus on economically backward and socially deprived students.
- To make them socially responsible and independent persons.

1.3.2 Mission

The Institute adheres and focuses towards:

- To impart job oriented education useful to the industry and society.
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- To promote innovation, training, consultancy applicable and research for useful to society and industry.
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It is the objective of the College is

- To provide career oriented education to all.
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- To build confidence in students with quality assurance to enable them to face new challenges around the world.
- To create social awareness through NSS activities.



1.3.4 Motto

The College channelizes its efforts towards the motto of "Right to education."

2. Overview

2.1 Summarised Populace analysis for 2022-2023

2.1.1 Students data

The data (shared by the Institute) shows there were **575 students**.

2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Admin staff	02	01	03
2	Teaching staff	06	26	32
3	Non-Teaching staff	05	01	06
Total Staff Members		13	28	41

Table 1: Staff data of the Institution for 2022-2023

The staff data shows the Institute premises had a total of **41 Staff Members**.

2.2 Summarised Populace analysis for 2021-2022

2.2.1 Students data

The data (shared by the Institute) shows there were **590 students**.

2.2.2 Staff data

S. No.	Type	Male	Female	Total
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Table 2: Staff data of the Institution for 2021-2022

The staff data shows the Institute premises had a total of **38 Staff Members**.

3. Research

3.1 Site & Institute Building Spread Area

The Institute is spread over **2.5 acres** with a built-up area comprising of **33,988.98 sq. ft.** designed into multiple blocks for educational and residential purposes for a populace of 616 stakeholders (Students and staff members).

3.2 Institute Infrastructure

3.2.1 Establishment

The Institute was established on **2001**

3.2.2 Spatial Organisation

The Institute is located in a pollution free and healthy environment.

The Building is a Reinforced Cement Concrete (RCC) framework building.

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc.

3.3 Operation and Maintenance of the premises

The interview session was held with the staff regarding the operation and working hours. The Institution is open from Monday to Saturday with the timings being 08:00 am to 17:00 hours.



4. Investigation

4.1 Scope for improvement aspects

- ⇒ **Water tanks in all areas**
 - a. Include the information about size, capacity and usage
 - b. Paint the tank in light blue colour
 - c. Add signboards about the usage such as 'Drinking' or 'Secondary'
 - d. Add signboard and map about the process/ system in practice

- ⇒ **General aspects (Indoors areas)**
 - a. Zoning of the site w.r.t. space wise analysis
 - b. Signboards, signages, information and display boards at relevant locations.

- ⇒ **Library in the Campus**
 - a. Include silence board at various locations and at entrance.
 - b. Install book drop box system at the entrance of the library.
 - c. Upgrade smart scanning system for every book
 - d. Include a self service station for digitalization.



5. Documentation

5.1 Green Practices Audit

The increasing global warming and climate change have made us realise that apart from the enormous strategies the individual small efforts need to be taken by individuals and Educational Institutes as the younger generations are the future of the world and once they are taught about these practices only then can we assume a better future.

5.1.1 Green practices

We observed the following points during the Site investigation and data verification of the premises; these are common for all the Buildings on the premises.

- **Fresh environment** – *The College provides an eco-friendly ambience with fresh air and soothing environment which helps to maintain a physical and mental balance. This kind of a space it a must for an educational specially technical institute which is inviting and gives the stakeholders an opportunity to explore indoor and outdoor learning to a great extent.*
- **Silent and peaceful atmosphere** – *The College is located amidst residential areas which are well designed thus these help to maintain the pollution under control and provide a healthy ambience.*
- **Documentation of all the events** – *The best part about the College is the prompt and professional response, this was observed not only in the way the Team responded throughout the project but also through the documented data submitted be it the cleanliness report or the eco club activities report; each of these were documented and presented in a sophisticated manner which is highly appreciating.*



5.1.2 Community development

The details of extension initiatives under various heads in Institute are documented below:

S. No.	Type	Since	Coordinator name
1	National Service Scheme (NSS)	2003	Prof. Sushil M. Salvi

Table 3: Details of the extension initiatives by the Institute

The details of the environmental activities conducted as part of the extension initiatives by the Institute are documented below:

S. No.	Initiative	Particulars	Date
Academic year 1 2021-22			
1	World Environment Day	This day is celebrated as World Environment Day by National Service Scheme on 05/06/2021. Students should share selfie of planting 1 tree in their locality to National Service Planning Department.	5-Jun-21
2	Coastal clean up	Cleaning of Bhatye beach was organized on October 23, 2021.	23-Oct-21
Academic year 2 2022-23			
1	World Environment Day	This day is celebrated as World Environment Day by National Service Scheme. On 05/06/2022, students planted trees in their college premises and adopted village. Principal Dr. Asha Jagdale, Mr. Abhijit Hegshetye was present.	5-Jun-22
2	Rice Plant Lawani	On 17/07/2022, National Service Scheme organized Rice Farming Planting Project. Hon. Mr. Abhijit Hegshetye and Prof. Sushil Salvi guided students about the importance of agriculture and cultivation techniques.	17-Jul-22
3	Rice farming	On 18/07/2022, the National Service Scheme Department has initiated the Rice Farming Plantation Project. It was organized in the farm of Sonali Devrukhkar, this time Prof. Sushil Salvi guided Students about the importance of	18-Jul-22



		agriculture and cultivation techniques	
4	Disaster management workshop	Disaster management workshop taken on 11th August 2022. The purpose of the workshop was safe and save environment.	11-Aug-22
5	Coastal clean up	Mandvi and bhatye Coastal clean-up programme organized on the occasion of Azadika Amrut Mahotsav on 17th September 2022.	17-Sep-22
6	Geography Day	On the occasion of Geography day, Department conducted various activities related of Environment like Essay writing, and Poster making competition on 14th January 2023.	14-Jan-23

Table 4: Details of the environmental initiatives undertaken by Institute



5.2 Waste Audit

Waste is an inevitable part of our lives. Over the years the awareness about waste management techniques has given a rise to rethink how the waste can be avoided being sent to the landfills. The audit provides an approximation of the types of waste generated, location of waste collections, disposal techniques used, waste segregation methodologies adopted, and waste management strategies that are implemented in addition to the newer ways that can be adopted aiming to make the premise clean and sustainable.

5.2.1 Waste produced

S. No.	Type of waste	Source	Current Disposal	Can be retreated?	Methodology	
1	Solid waste	Toilets--Biodegradable waste	Soak pit connected for solid-liquid waste management	Yes	TREATED – Biogas plant can be initiated	
2	Liquid waste	Toilets, washbasins		Yes	TREATED - Sewage treatment plant can be initiated	
3	Paper waste	Newspaper and other paper		Given to vendor	Yes	TREATED – A recycling plant can be initiated
4	E-waste	Computers - Non-biodegradable waste			Yes	CONTINUE with the current practice
5	Plastic waste	Bottles, wrappers			Yes	TREATED – Tie-up with Bisleri's Bottles for change program or firm that is into clean fuels.
6	Dry waste in form of leaves	Open space & plantations, papers - Non biodegradable waste	TREATED – Dedicated zone where vermin-composting is undertaken	Yes	CONTINUE with the current practice but improvement is required	
7	Organic regular waste	Dust, dirt dust waste from indoor spaces				
8	Bio-waste	Sanitary waste	Vending machine is available	Yes	Tie-up with local government for dedicated bio-waste handover	

Table 5: Details of the waste management practices adopted by the team

There are twin litter dustbins available in the premises such as 47 nos. of bins in Indoor areas and 6 nos. of bins in the outdoor areas.



5.3 Water Audit

Water is one of the basic needs. Pure drinking water is a resource that needs to be preserved efficiently. A water audit helps to identify the sources of water consumption, and the water requirement by the premises is met by these sources. The effective usage of water without any wastage should be a mandatory practice. Understanding the techniques as per site context to increase water conservation in terms of awareness and practice can be identified and executed as part of this exercise.

5.3.1 Water availability and consumption

5.3.1.1 Source of Primary water supply

The Institute requires water from the Local Municipality for drinking water purposes. There are dedicated water tanks facilities available in the premises.

S. No.	Type	Capacity (litres)	Nos.	Location
1	Overhead	10,000	2	Terrace
2	Fire tank	10,000	1	Underground

Table 6: Details of the water facilities

5.3.1.2 Source of Secondary water supply

The Institute uses the following sources of water supply for secondary usages such as watering plants, kitchen, toilets, and wash basins and other spaces. There are two bore wells available at present.

5.3.1.3 Source of Tertiary water supply

The tertiary source of water is the source of water harvesting; the project at present is practiced through pits in the premises. The team has suggested connecting the overflow pipe to the bore well for ground water recharging.

5.3.1.4 Source of Reusing waste water

This initiative is not practiced at present. Since the campus is located in RURAL premises, the system is not an urgent requirement.



5.3.2 Areas of water usage

Based on the inventory done and data shared by the staff it was found that the premise has the facilities such as water cooler, toilets, washbasins etc.

5.4 Health and Hygiene Audit

The hygiene is a part and parcel of our daily life. It is extremely essential to keep the surroundings clean in the same manner as we would want our houses to be.

Educational Institutes have a bigger role to play in order to affect the young minds in the positive manner through better hygienic practices.

5.4.1 Facilities available

The Institution has washroom facility, hand wash, drinking water and dustbin facilities.

5.4.2 Hygiene aspects

The team should undertake steps to upgrade the hygiene areas of the site as per the instructions and discussion. **The current practices however are fine.**



6. Suggestions

Section-wise suggestions related to premises

The following suggestions are to be considered as a ***first priority*** for implementation. These **should be executed within the next 2.5 years from the date of the Report submission.** The Institute can execute a plan after discussion with Project Head.

6.1 Green practices Audit

- **Plant as a gift** - As a kind gesture, the guests visiting the premise can be asked to plant a small plant on the premise itself and they can be even given plants/bouquets from the flowers of the plants on the premise as a gift.
- **Environmental awareness** - There can be various slogans in local and national language on the compound wall giving the message of saving the environment through the joint efforts of the students and staff thereby making the student socially and environmentally responsible citizens.
- **Tree adoption scheme in the premises** - The Institute can adopt the One Faculty – One tree adoption scheme; this can be practiced on occasions such as toppers meet, guest sapling plantations, specific zoning of the tree adoption area. this can be very beneficial, especially during the summer season.
- **Signages on the plants mentioning scientific names** - The practice of having the names of each plant and tree will provide awareness among the staff and students.
- **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.



6.2 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.
- **Signages** - Messages about avoiding wastage should be placed at appropriate locations.
- **Dustbins at every 100m** - There should be a dustbin at every 50-100m in open spaces
- **Organic compost pit maintenance methodology** - The Institute can recheck the current methodology as it can yield better results in terms of quantity if it is well maintained with the following strategies:
 - The sanitary pad incineration dust can be sent to the compost pit.
 - There should be a balance of brown and green waste material
 - Shred the materials before adding them to pit
 - Add twigs
 - Stir occasionally
 - Add water in less quantity to avoid the smell
 - Keep ample air circulation to avoid the smell
 - Regular monitoring and maintenance.
- Join hands for **'Trash to Treasure' initiative** as a Donor or Beneficiary Institute through which any type of building or material waste shall be collected from your Institution, recycled and given to an NGO or Organization for reuse.
- 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.
- Write to NGOs such as *Adar Poonawala Foundation* for twin litter dustbins and beautification projects.



6.3 Water Audit

- **Wastewater from toilets** - This should be collected and a wastewater treatment plant can be installed in the open space wherein this water can be treated and reused for gardening and toilet flushing.
- **Rain water bunds** – There should be landscape beautification project undertaken to appropriate channelize the rain water through bunds and similar facilities.

6.4 Health and Hygiene Audit

- **Health related provisions** – There should be provisions for a dedicated health centre and 24x7 available ambulance services inside the premises.
- **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



Investigation of the Library and the Classroom spaces



Investigation of the Classroom spaces and the courtyard area



Investigation of the Rooftop and the pit area



7. 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.

- 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>



A handwritten signature in blue ink, appearing to read "S. P. Hegshetye".

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GV/ENVT/10-23/231

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The staff data shows the Institute premises had a total of **38 Staff Members**.



3. Research

3.1 Site & Institute Building Spread Area

The Institute is spread over **2.5 acres** with a built-up area comprising of **33,988.98 sq. ft.** designed into multiple blocks for educational and residential purposes for a populace of 616 stakeholders (Students and staff members).

3.2 Institute Infrastructure

3.2.1 Establishment

The Institute was established on **2001**.

3.2.2 Spatial Organisation

The Institute is located in a pollution free and healthy environment.

The Building is a Reinforced Cement Concrete (RCC) framework building.

There are provisions for staircase for accessibility on the premises, whereas there are amenities such as CCTV, a first aid room, etc.

3.3 Operation and Maintenance of the premises

The interview session was held with the staff regarding the operation and working hours. The Institution is open from Monday to Saturday with the timings being 08:00 am to 17:00 hours.



4. Investigation

4.1 Scope for improvement aspects

➤ Extra care for the rooftop areas

- Introduce the signboards about 'No students are allowed to enter this area'
- Increase the height of parapet walls
- 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 (Outdoor areas)

- Increase in green cover on rooftop
- Placards and manuals for awareness
- Dedicated reserved parking for physically disabled
- Development of breakout zones at relevant locations
- Develop plantations around the vertical garden areas
- Develop paved walkways
- Introduce information boards everywhere
- Increase sensitization programmes
- Upgrade the website w.r.t. green initiatives
- Introduce zone wise details at relevant locations



5. Documentation

5.1 Open Spaces

There is an open space in the plot utilised by all the shared campuses, this provides a good amenities and recreational spaces feature in premises.

5.2 Flora audit

A flora survey was carried out to identify the total numbers of plants and trees. The landscape area has a variety of plantations the details of the same are documented below.

S. No.	Plant name	Type	Nos.
1	Coconut	Tree	5
2	Banana	Tree	2
3	Mango	Tree	8
4	Hibicus	Tree	14
5	Cashu	Tree	4
6	Chiku	Tree	1
7	Badam	Tree	3
8	Jasmin	Shrub	2
9	Lotus	Plant	1
10	Rose	Plant	1
11	Star Jasmin	Shrub	2
12	Amla	Tree	3
13	Yellow Olender	Shrub	1
14	Puncture Vine	Shrub	2
15	Holi Basil	Herb	20
16	Anand Floor	Shrub	1
17	Show Tree	Tree	16
18	Teak	Tree	1
19	Umbar	Tree	2
20	Adulasa	Herb	1
21	Bay Leaf	Herb	1
22	Lemon Grass	Herb	3



23	Banyan	Tree	1
24	Papaya	Tree	3
25	Taro Leaves	Shrub	1
26	Rubber	Tree	1

Table 3: Details of the Flora in the premises

At present there are 100 numbers of plantations in the premises. All of these are planted by the on various occasions and some have grown naturally.

5.3 Fauna audit

There are varieties of biodiversity available as fauna in the premises.

Fauna available	Names
Birds	Sparrow, Crow, Eagle, Dove, Pigeon
Insects	Mosquito, Spider, Ant, Butterfly, Fly, Honeybee
Invertebrates	Snail, Lizard, Cockroach, Annelida
Reptiles	Snake, Viper
Amphibians	Frog
Mammals	Monkey, Goat, Cat

Table 4: Details of the fauna in the premises

5.4 Noise Audit

On a macro level the Institute is surrounded by public buildings and minimal residential blocks thus there is a peaceful and noise free arena observed inside the premises.

5.5 Carbon Footprint Audit

5.5.1 Eco-friendly Commuting Practices

- The site is located in a rural locality.
- Overall, the carbon footprint is well under control.
- Students and staff members commute using public transport.
- There are no major fossil fuels used inside the premises.



5.5.2 Heat Island Reduction

Certain measures have to be taken to keep outdoor temperatures under control.

5.5.3 Outdoor Light Pollution Study

The Institute compound lights are not upward looking thus, these do not cause light pollution.

5.6 Fire Safety

Fire and life safety are an important consideration of the National Building Code 2016. This aspect is touched upon as part of this study in the capacity of an Architect registered with the Council of Architecture. As part of the research, fire safety audit was considered from the 'Building systems' perspective. *At present, the following are available in the premises.*

- ⇒ Fire extinguisher and sand buckets.
- ⇒ Open staircase without any barriers and free of storage or combustible material.



6. Suggestions

The following suggestions are section-wise recommendations and are supposed to be **executed within the next 2.5 years from the date of the Report submission**. The Institute can execute a plan after discussion with Project Head.

6.1 Site beautification

- **Beautification of the entrance pathway** - The existing bricks (waste from the existing new construction going on) can be used or upgraded the pathway through an appropriate Landscape Architecture design.
- **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.
- **Nutrition pits** - Certain pits can be demarcated as 'Nutrition pits' where the organic food from the kitchen and Canteen fruit peels and fruits or vegetables can be degraded for making nutrition-rich soil.
- **Garden development** - The existing open space should be designed as an Architectural landscape.
 - *Nursery documentation, expansion and beautification* - The premises should have a nursery, details can be decided as per the landscape beautification.
 - *Scientific name plates and QR codes* - The team should undertake a project to have name plates with QR codes on every plant of the premises.
 - *The landscape redesign and ecological redesign* - This should be done to increase the shade cover in the entire premises.
 - *Introduce various types of gardens inside the premises* - The examples such as Flower gardens, Woodland gardens, Rock gardens, Water gardens, Vegetable and herb gardens, Roof gardens, Scented gardens, Medicinal gardens and Botanical gardens can be practiced.



6.2 Heat island reduction

- **Cool rooftops** - The Terrace rooftops should be painted with Cooltop – reflective materials to reflect the harsh sun rays and reduce the heat absorption in the top most floor and surrounding areas of the building.



Plate 1: Cool roof comparative analysis (For reference purpose only)

Source: Image by <https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-781474980105387>

- **Water bodies** – Lily gardens in small water ponds could be developed in the outdoor areas to reduce the heat, upgrade rain water harvesting and beautify exterior areas.



Plate 2: Lily pond (For reference purpose only)

Source: Image by [Author and the team](#)



- **Light colour flooring for cooler walkways** – The internal walkways in the outdoor areas should be painted in cool and reflective colours; if there is a need to use paver blocks they should be of light toned colour and less absorptive/ radiating materials.



Plate 3: Cool walkways (For reference purpose only)

Source: Image by <https://www.dutchessstoneworks.com/outdoor-living-spaces/stone-walkways-and-stairs/>

6.3 Life safety

- **Fire station** – A dedicated fire station could be established within the premises as part of the Fire and Life safety practices.
- **Mandate fire extinguisher in spaces** - One fire extinguisher should mandatorily be there in every space which has an air conditioner/ gas cylinder.
- **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.
- **Fire and life safety practices** – Provisions such as signages, fire alarm, smoke detectors, fire hydrant cabinets, sand buckets, hose reel, fire cabinet, fire water tank and fire pump near the entrance block whichever is applicable should be practiced.
- **Awareness** - Fire layouts in immediate spaces outside the lift, on the staircase landing, signages mentioning 'Do not use lift in case of fire' additionally fire exit signages, boards should be put up at all possible locations.



- **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.

6.5 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.
- **Avoid burning waste** - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff
- **Bicycles as a gift** - As an appreciation gesture maybe the student's toppers/ staff best performers can be awarded a bicycle occasionally.
- **Plant more radiation absorbing plants** - The following flora helps in reducing the harmful effects to a certain extent, the Institute can develop a radiation free zone and take to planting these through potted plants or permanent planting:
 - a. Spider plant
 - b. Rubber plant
 - c. Asparagus fern
 - d. Snake plant
 - e. Nelumbo nucifera (Includes colourful flowers)
 - f. Cactus
 - g. Areca palm
 - h. Mustard green
 - i. Betel
 - j. Aloe vera
 - k. Sprengers asparagus
 - l. Fiddle fig



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



Investigation of the Library and the Classroom spaces



Investigation of the Classroom spaces and the courtyard area



Investigation of the Rooftop and the pit area



7. 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 centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.
- Reference images for suggestions:
 - ❑ <https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387>
 - ❑ <https://earthbound.report/2021/07/14/5-ways-to-reduce-the-urban-heat-island-effect/>



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