

ENVIRONMENT AUDIT

STUDY PERIOD (TWO YEARS) 2022 – 2023 AND 2023 – 2024

Sustainability study
AUDIT REPORT

Studied for
O.P. Jindal University
Punjipathra, Raigarh,
(C.G.), PIN:496109

Studied in the capacity of
Accredited and Certified GBP



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Disclaimer

The Audit & Assessment Team has prepared this report for **O.P. Jindal University** located at Punjipathra, Raigarh, (C.G.), PIN:496109, India based on input data submitted by the University and 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.

These can be implemented phase wise or as a whole depending on the decision taken by the internal team. The warranty or undertaking, expressed or implied is made and no responsibility is accepted by Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.

The audit is a thorough study based on the inspection and investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied or regenerated in any form.

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.

The Study is conducted in capacity of Accredited & Certified Green Building Professional with extensive experience.

Ar. Nahida Abdulla

Greenvio Solutions

Developing Healthy and Sustainable Environments

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Acknowledgement

The Audit Assessment Team extends its appreciation to **O.P. Jindal University, Chhattisgarh, India** for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Dr. R. D. Patidar**, Hon'ble Vice Chancellor and **Prof. Anurag Vijaywargiya**, Hon'ble Registrar.

We are also thankful to Institute's Task force who have played a major role in data collection - **Dr. Kalyan Phani**, Associate Professor-Metallurgy; **Dr. Deepak Singh**, Associate Professor-Electrical and **Dr. Surendra Dwivedi**, Director – Admin

The kind gesture of the **Admin and Non-teaching Staff members** for the inventory and data collection is quite commendable.

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

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1. Introduction

1.1 Statements of the Institution

1.1.1 Vision for the future

The University envisions "To become a role model among the higher educational institutions globally aims at nurturing young minds to lead a sustainable transformation of society through excellence in value-based education, research, innovation, and entrepreneurship."

1.1.2 Mission for the future

The University will work towards the following mission:

- *To develop programs and courses aligned with new-age technologies to create an industry ready talent pool, who fuel the growth of the society.*
- *To foster outcome-based education to enhance employability by adopting emerging technologies and experiential pedagogy across its programs, to make students understand the concept and give them the ability to solve real-world problems.*
- *To harness local and global collaborations to create an ecosystem for enhancing teaching, research, and institution building.*
- *To embed liberal education to develop well rounded globally competent leaders with holistic approaches who can work at multiple levels of responsibilities.*
- *To create an Industry focused environment to foster innovation and entrepreneurship for sustainable development.*

2. Overview

2.1 Summarised Populace analysis for 2023-2024

2.1.1 Students data

The data (shared by the Institute) shows there were **1,913 students**.

2.1.2 Staff data

S. No.	Type	Male	Female	Total
1	Teaching staff	91	32	123
2	Non-Teaching staff	107	28	135
Total Staff Members		198	60	258

Table 1: Staff data of the Institution for 2023-2024

The staff data shows the Institute premises had **258 Staff Members**.

2.2 Summarised Populace analysis for 2022-2023

2.2.1 Students data

The data (shared by the Institute) shows there were **1,639 students**.

2.2.2 Staff data

S. No.	Type	Male	Female	Total
1	Teaching staff	87	28	115
2	Non-Teaching staff	105	25	130
Total Staff Members		192	53	245

Table 2: Staff data of the Institution for 2022-2023

The staff data shows the Institute premises had **245 Staff Members**.

3. Observation

This chapter focuses on the positive aspects adopted by the Institute either based on the previous year study or as an act towards sustainability goals.

Section 1 – Eco-restoration of outdoors (Landscape perspective)



Plate 1: Plantations in courtyard area of the premises

Section 2 – Documentation

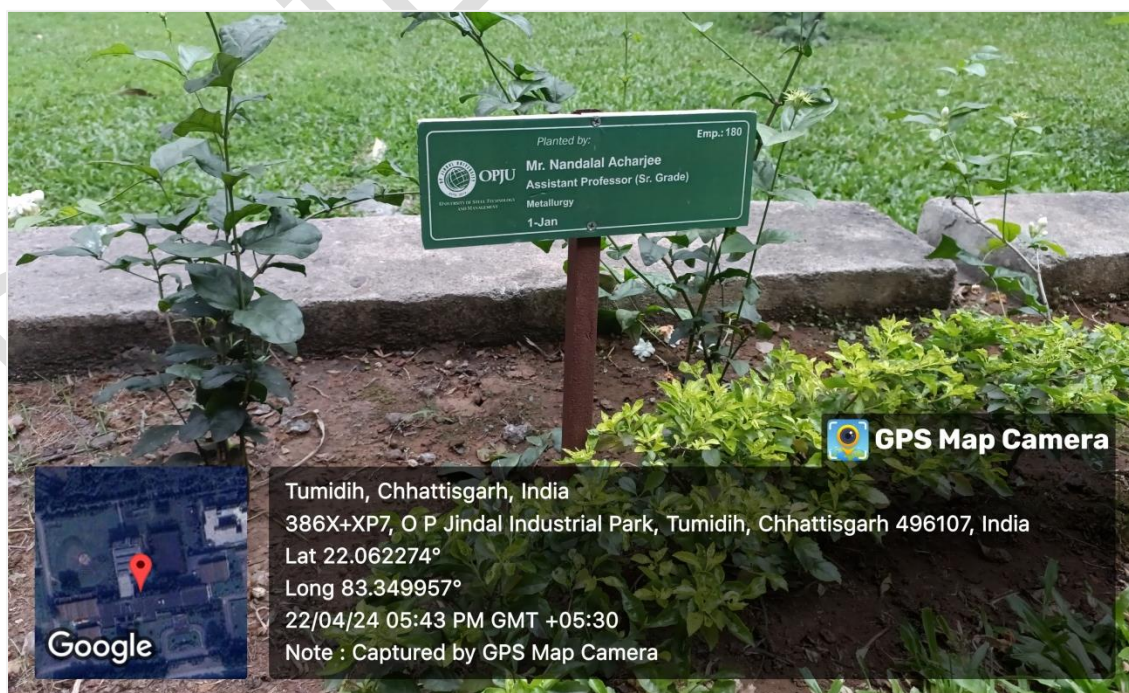


Plate 2: Documentation of the plantations

Section 3 – Amenities

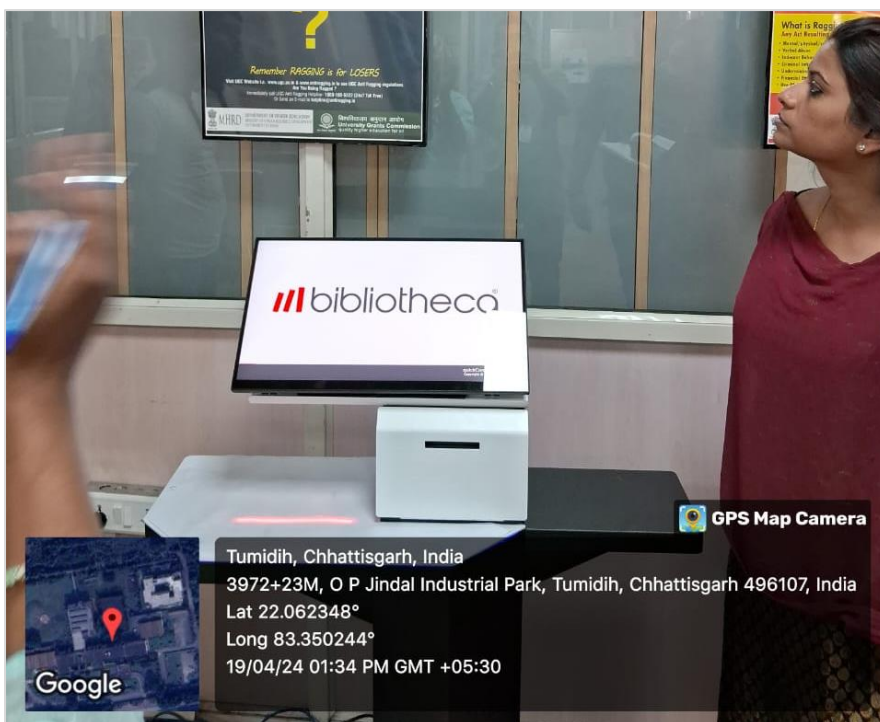


Plate 3: Digital library facility in the premises

Section 4 – Environmental management systems

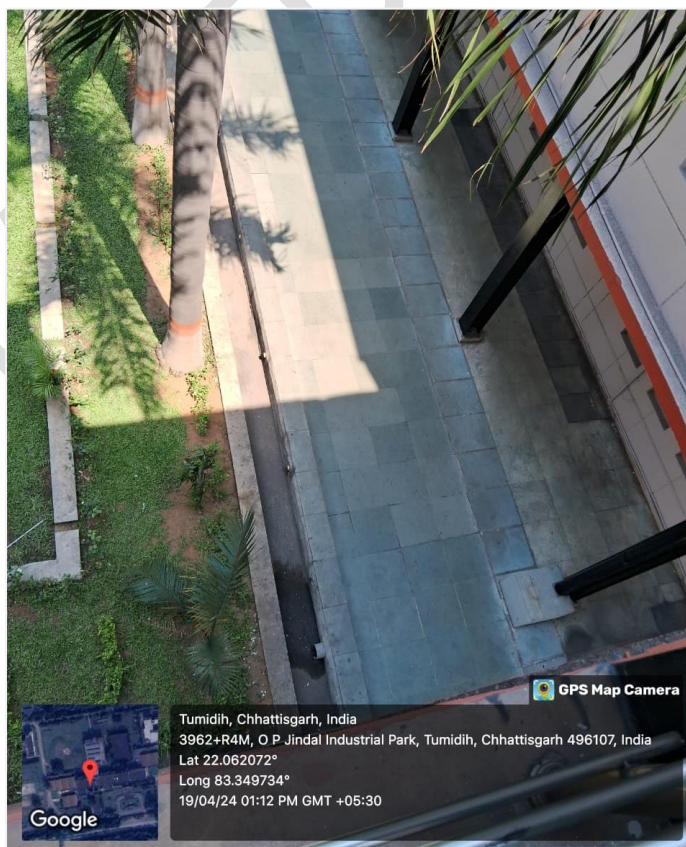


Plate 4: Shaded walkways in the premises



Plate 5: Seminar to the stakeholders with the Eco-club

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4. Compliance

The compliance study was carried out through investigative ways. This was done to understand extent of implementations based on previous reports.

- ➔ Original report study for 2020-2021 and 2021-2022 (Site visit 16 November 2022)
- ➔ Renewal study one (Current) for 2022-2023 and 2023-2024


4.1 Compliance status

The details of compliance are analysed on previous year Report i.e. 2020-2021 and 2021-2022 depicted with following background colour codes:

➔ Implemented (Fully)

➔ Partially implemented

➔ Not implemented

S. No.	Recommendation	Compliance Status evidence detail
Section 1 – Eco-restoration of outdoors (Landscape perspective)		
1.	Bird house/ Feeders	Evidence shared by the team 
2.	Courtyards and duct areas – These are located in the internal and setback should have vertical gardens	Implemented by improving the green cover

for beautification



Herbal garden in the premises



3.

The nos. of vegetation/ plantation should be increased because the University premise is located in an Industrial area which has a lot of pollution in the atmosphere.

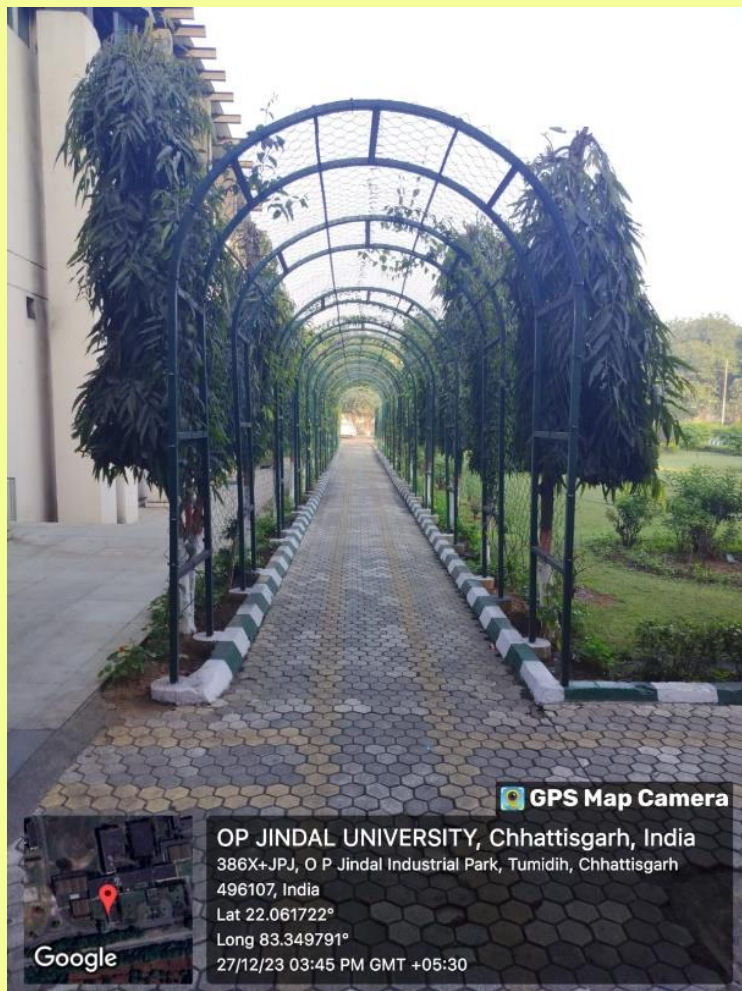


4.

Pergola (Bamboo shed) with vertical gardens in the open ares mainly

above the reception. Mani plants may be grown over the pergola

Pergola has been introduced as per the suggestions in two places.
Also Green Corridors have been installed at reception and library areas



5. Installation of Roof Top and vertical type gardens


Not implemented

Section 2 – Documentation


6. Website updating with the green initiatives undertaken by the university

Undertaken



7.	Identify and create Green Zones, Oxy Zones, No vehicle Zones, Orange zone	<p>Undertaken documentation board only for 'No vehicle zone'</p>  <p>GPS Map Camera</p> <p>OP JINDAL UNIVERSITY, Chhattisgarh, India 386X+JPJ, O P Jindal Industrial Park, Tumidih, Chhattisgarh 496107, India Lat 22.061722° Long 83.349791° 30/12/23 11:07 AM GMT +05:30</p> <p>Google</p>
8.	University may go for Carbon sequestration study	Not implemented
9.	Plan to get into Guinness book of world record by some green initiatives	Not implemented
10.	All plants needed to be named along with a QR code consisting of the document related to the plant or green initiatives of the university	Not implemented

Section 3 – Amenities

11.	E-vehicles should be there in campus	<p>The Institute has purchased golf cart and the students have developed solar car</p> 
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12.	One Electrical Vehicle charging point in parking area	Not implemented
Section 4 – Environmental management systems		
13.	Paperless technologies for offices	<p>Biometric system undertaken</p> 
14.	Pollution Control - Bicycles as a gift	Not implemented
15.	Air Quality monitor installation	Not implemented
16.	Installation of Roof Top and vertical type gardens	Not implemented

Table 3: Details of the compliance study

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Plate 7: Discussion with the team



Plate 8: Investigation of the amenities and facilities in the premises



Plate 9: Group photo with the team post seminar for stakeholders

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: O.P. Jindal University Date: 19/04/2024

Document objective: Induction 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. M. Kalyan Phani	Internal	Coordinator, NAASCC	<i>M. Kalyan Phani</i>
4.	Ajay Pandey	Internal	Asst. Director Admin	<i>Ajay Pandey</i>
5.	Dr. Deepak Singh	Internal	Dr. Director IQAC	<i>Dr. Deepak Singh</i>
6.	Brijesh Sengupta	Internal	Asst. Registrar	<i>BK Sengupta</i>
7.	Dr. Anurag Sharma	Internal	Coordinator - Eco Club	<i>Anurag Sharma</i>
8.	Dr. Jayashram Reth	Internal	Head UG Program, Som	<i>Reth</i>

Anurag Sharma
 19/4/2024
 Signature & round seal
 Name: Prof. Anurag Vijaya Sengupta
 Designation: Registrar
 For the said Institute



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



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Plate 10: Evidence file related to induction meeting attendance record

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: O.P. JINDAL UNIVERSITY Date: 19/04/2024

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 S.K. Singh	Internal	Professor	
4.	Dr. Deepak Singh	Internal	Dy. Director, IQAC	
5.	Dr. Jagabansh Rath	Internal	Associate prof, Head UG	
6.	Brijesh Sengupta	Internal	Prof, Som	
7.	Dr.M.Kalyan Phani	Internal	Asst. Registrar	
			Coordinator - NAASC	
8.	Dr. Ushaswati Chakraborty	Internal	Asst Professor	
			Civil	
9.	Dr. Anurag Sharma	Internal	Coordinator - Eco Club	
10.	Dr. C. Anil Kumar	Internal	Director - IQAC	

Signature & round seal
 Name: Prof. Anurag Vijayarajgiya
 Designation: Registrar
For the said Institute



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



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Plate 11: Evidence file related to exit meeting attendance record

5. Suggestion

The suggestion (inference) would act as a 'PLAN OF ACTION' to implement all the suggestions in a detailed manner. The same has been identified in two phases for a total duration of three years.

➔ Phase 1

- Duration: One year from the date of Report submission – Shared currently
- These are first hand suggestions
- They are easy and quick to implement
- They involve close very less or almost no expenses
- They can serve as a foundation for the entire plan of action

Section 1 – Eco-restoration of outdoors (Landscape perspective)

➔ Feeders

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

➔ Numbering the plantations in the premises

- Make a list of all the plantations in the premises
- Secondly, start numbering the plantations in either of the ways:
 - i. Painting the nos. on iron plates and nailing the same
 - ii. Printing the nos. on paper, laminating and pasting the same
 - iii. Painting the nos. with letters and nos. directly
- Care should be taken that the display should be visible
- Uniform color palette should be identified and used
- Measures should be taken to avoid withering during monsoon
- This could be undertaken as a student activity



Reference suggestions 1: Numbering the plantations

➔ Improve the ecological footprint of the premises

- Undertake the landscape ecological redesign to increase green cover
- Opportunity can be explored to have a dedicated:
 - i. Nursery
 - ii. Greenhouse
 - iii. Organic farm
 - iv. Kitchen garden in backyard
- The following plantations can be planted for Carbon neutralisation as an additional measure, even though they might be existing in premises
 - i. Pine – Known for its ability to sequester carbon
(<https://www.single.earth/blog/which-trees-absorb-the-most-carbon#:~:text=Pine%20trees%20as%20carbon%20sinks,their%20ability%20to%20sequester%20carbon.&text=These%20trees%20are%20found%20in,also%20make%20good%20landscape%20plants>)
 - ii. Neem – Helps reduce greenhouse gases through photosynthesis absorbing large quantities of CO₂ producing oxygen
(<https://neemfoundation.org/greening-india-with-neem/#:~:text=The%20planting%20of%20Neem%20trees,of%20CO2%20and%20producing%20oxygen>)
 - iii. Peepal – Can uptake CO₂ during the night as well because of its ability to perform a type of photosynthesis called Crassulacean Acid Metabolism (CAM)

([https://nurserylive.com/blogs/sustainable-living/do-you-know-plants-that-give-oxygen-24-hours#:~:text=2.-,Peepal,Crassulacean%20Acid%20Metabolism%20\(CAM\)\)](https://nurserylive.com/blogs/sustainable-living/do-you-know-plants-that-give-oxygen-24-hours#:~:text=2.-,Peepal,Crassulacean%20Acid%20Metabolism%20(CAM))))

- iv. Bamboo - Can absorb as much as 12 tonnes of carbon dioxide per hectare per year, giving the plant a potentially crucial role in stabilising our planet's atmosphere.

(<https://www.theguardian.com/environment/2003/mar/20/research.science#:~:text=Research%20in%20Japan%20and%20elsewhere,in%20stabilising%20our%20planet's%20atmosphere>) and <https://www.nelda.org.in/15-indian-trees-that-produce-the-most-oxygen>

- v. Teak – The highest capacity for carbon sequestration among trees in India. This is the finding of a study conducted by the Gujarat Ecological Education and Research (GEER).

(<https://timesofindia.indiatimes.com/city/ahmedabad/teak-absorbs-max-co2-from-air-helps-check-global-warming/articleshow/51721842.cms>)

➔ Plant as an extension of 'Green motto'

- External resource persons visiting the premises can share the goal of green environment in the following ways:
 - i. Plant a sapling within the premises
 - ii. Handover a sapling as a gesture

➔ Nutrition pits

- Certain pits (mound of earth covered in green grass/ shrubs) 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.

Section 2 – Documentation

➔ Messages on the beam area

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

➔ Awareness

- Introduce zone wise display boards at relevant locations

Section 3 – Amenities

➔ Facilities

- Speed limit signage
- Speed breakers
- Zebra crossing
- First aid box near the administrative area
- Suggestion box every floor of the premises

Section 4 – Environmental management systems

➔ Pollution control measures

- Vehicle usage - Restricting the speed limit of vehicles on the premises to 10 km per hour, not honking on the premises will help in maintaining the sound in control and emphasis on a silent zone.
- Avoid burning waste - The waste produced on the premises should not be burned as it is dangerous to the health of students and staff

➔ Heat island control measures

- Cool rooftops
 - i. Keep terrace areas free of any kind of storage materials
 - ii. Terrace rooftops can be painted with Cooltop (Reflective material) to reflect the harsh sun rays and reduce the heat absorption in the top most floor and surrounding areas of the building.
 - iii. Introduce signboards about 'No students are allowed to enter'
 - iv. Undertake feasibility study of before - after temperature reading.

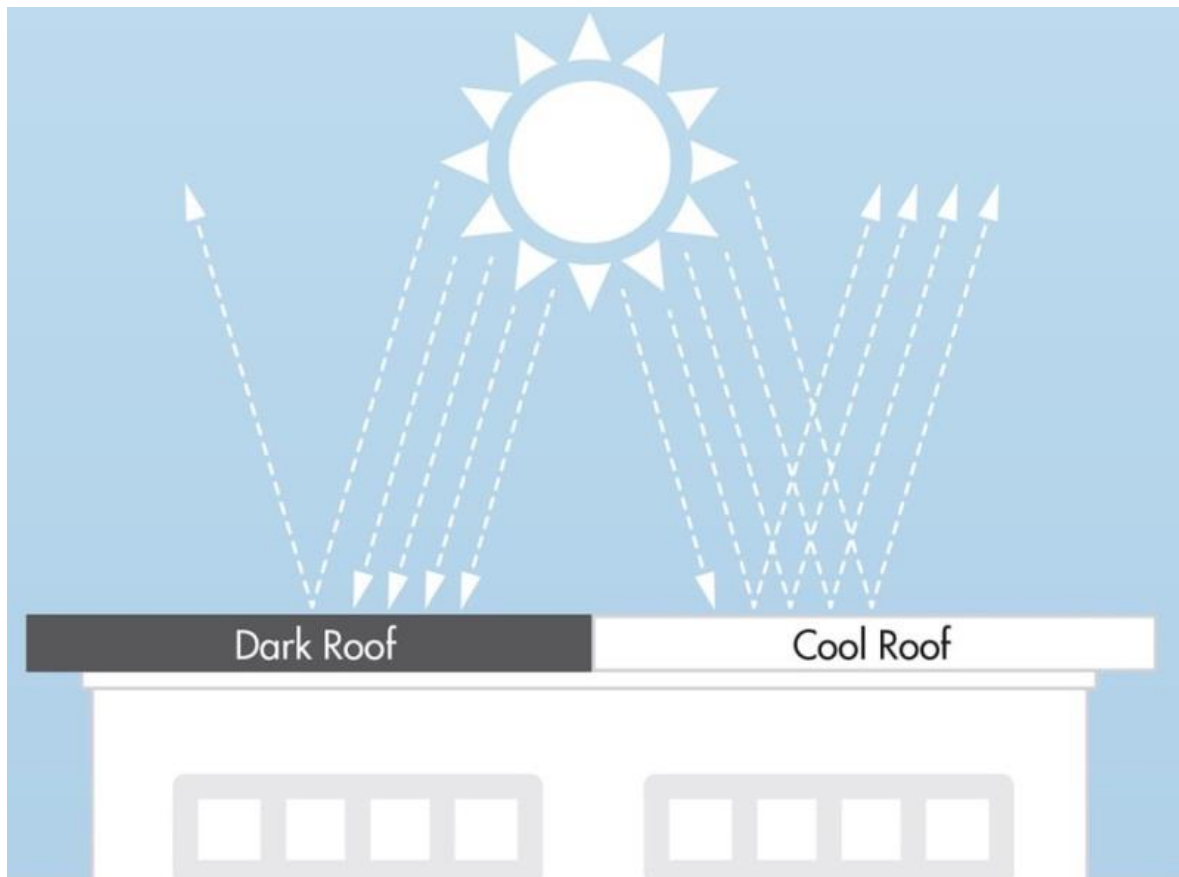


Plate 12: Cool roof comparative analysis (For reference purpose only)

Source: Image by <https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387>

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6. 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.

National references

- ➔ IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
- ➔ IGBC Green Landscape Rating system, March 2013

International references

- ➔ 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/>
- ➔ Urban heat island effect <https://www.epa.gov/heatislands/what-you-can-do-reduce-heat-islands>

