

ENVIRONMENT AUDIT

STUDY PERIOD (ONE YEAR) 2023 - 2024

Sustainability study
AUDIT REPORT

Sree Narayana Guru College of Commerce

P. L. Lokhande Marg, Chembur (West),
Mumbai - 400089, Maharashtra, India

Studied in the capacity of

Accredited and Certified
Green Building Professional



Studied by

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

Email: greenviosolutions@gmail.com

Disclaimer

The Audit Team has prepared this report for **Sree Narayana Guru College of Commerce** located at P. L. Lokhande Marg, Chembur (West), Mumbai - 400089, Maharashtra, India 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.

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

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Developing Healthy and Sustainable Environments
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Acknowledgement

The Audit Assessment Team extends its appreciation to **Sree Narayana Guru College of Commerce, Maharashtra** for assigning this important work of Environment Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are extended are due to everyone from the Management.

We are also thankful to Institute's Task force who have played a major role in data collection.

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208



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1. Introduction

1.1 About the Institution

1.1.1 Vision

The Institute proposes "Empowerment through Higher Education to all strata of Society"

1.1.2 Mission

The Institute adheres and focuses "Quality education to all irrespective of caste, creed, socio-economic status and uplift the poor and downtrodden".

2. Overview

2.1 Summarised Populace analysis for 2023-24

2.1.1 Students data

The data (shared by Institute) shows there were 1,814 students.

2.1.2 Staff data

Sl. No.	Particulars	Male	Female	Total
1	Teaching Staff	16	26	42
2	Non-teaching Staff	12	10	22
Total		28	36	64

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

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3. Observation

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Evidence documents for Site visit of external audit team

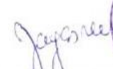
Audit team headed by external expert - Ar. Nahida Abdulla
Accredited & Certified Green Building Professional, ISO IA (IMS)
Audit objective: Green Building up gradation of the premises


Audits covered: Green audit Energy audit Environment audit


Institute: Sree Narayana Guru College, Chennai Date: 8/11/2024

Document objective: Inferences of the Site visit

Observations (Positive aspects)	Suggestions (Improvement aspects)
Green Audit	
Waste management practices have been improved as informed by team;	- Undertake social programs on a macro level
Energy Audit	
- Renewable energy has been implemented through rooftop solar panels.	- Documentation of energy reduction should be undertaken
Environment Audit	
- Cleanliness w.r.t. green cover has been undertaken	- Systems of plantation in and around campus still has scope for improvement


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



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Plate 1: Evidence files related to inferences

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Evidence documents for Site visit of external audit team

Audit team headed by external expert - Ar. Nahida Abdulla
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 Audit objective: Green Building up gradation of the premises

Audits covered: Green audit Energy audit Environment audit

Institute: Sree Narayana Guru College Date: 8/11/2024

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. Jayashree V	Internal	In Charge Principal	
4.	Dr. S.P. Hinduja	Internal	Vice Principal	
5.	Ms. Navena Suresh	Internal	Faculty	


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 Designation: I/c Principal
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Plate 2: Evidence files related to proof

4. Investigation

4.1 Micro-site study

The following results were carried out during visit on **08 November 2024.**

1. Stilt area @ 08:51

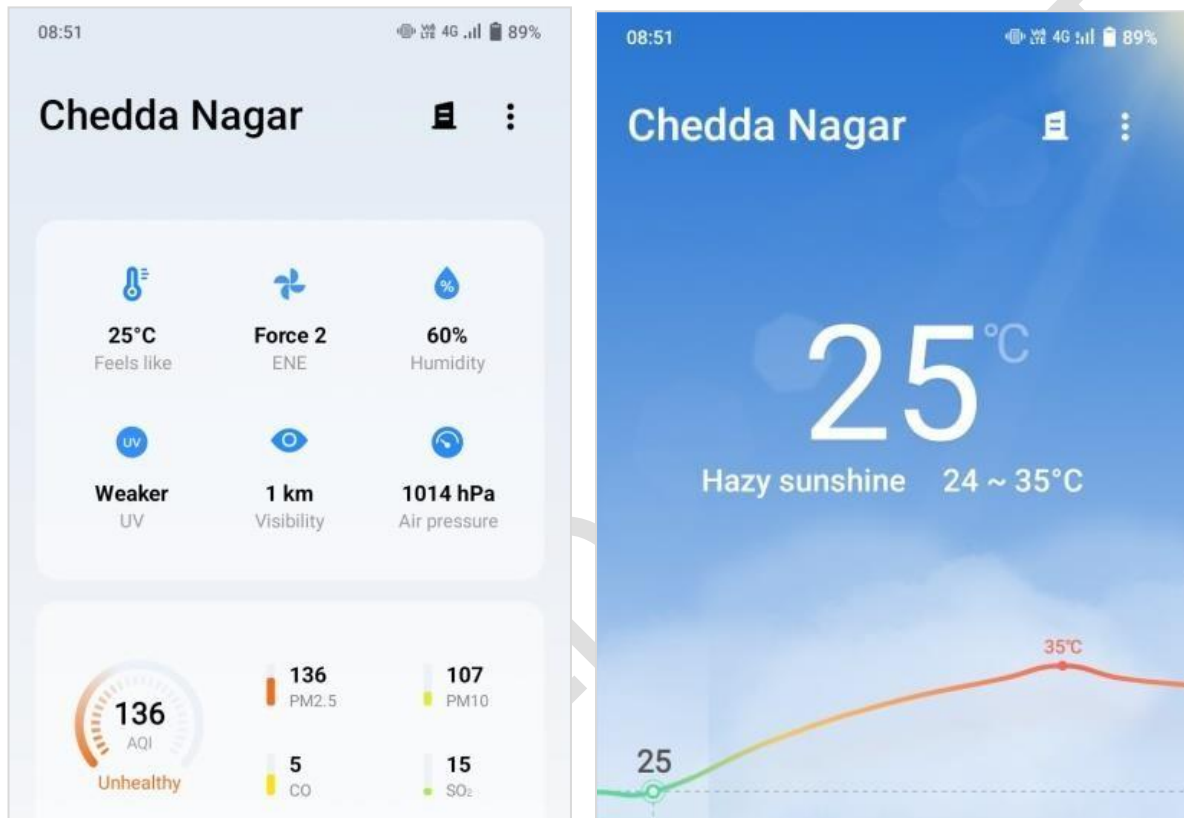


Figure 1: Study at stilt area

The details are noted below:

- ➔ Micro-climate temperature of site in Degree Celsius – 25
- ➔ Particulate matter 2.5 micrometres or less in diameter (PM_{2.5}) – 136
- ➔ Particulate matter 10 micrometres or less in diameter (PM₁₀) – 107
- ➔ Carbon Monoxide (CO) – 5
- ➔ Sulphur dioxide (SO₂) – 15

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2. Office (Internal area) - Air conditioned space @ 10:06

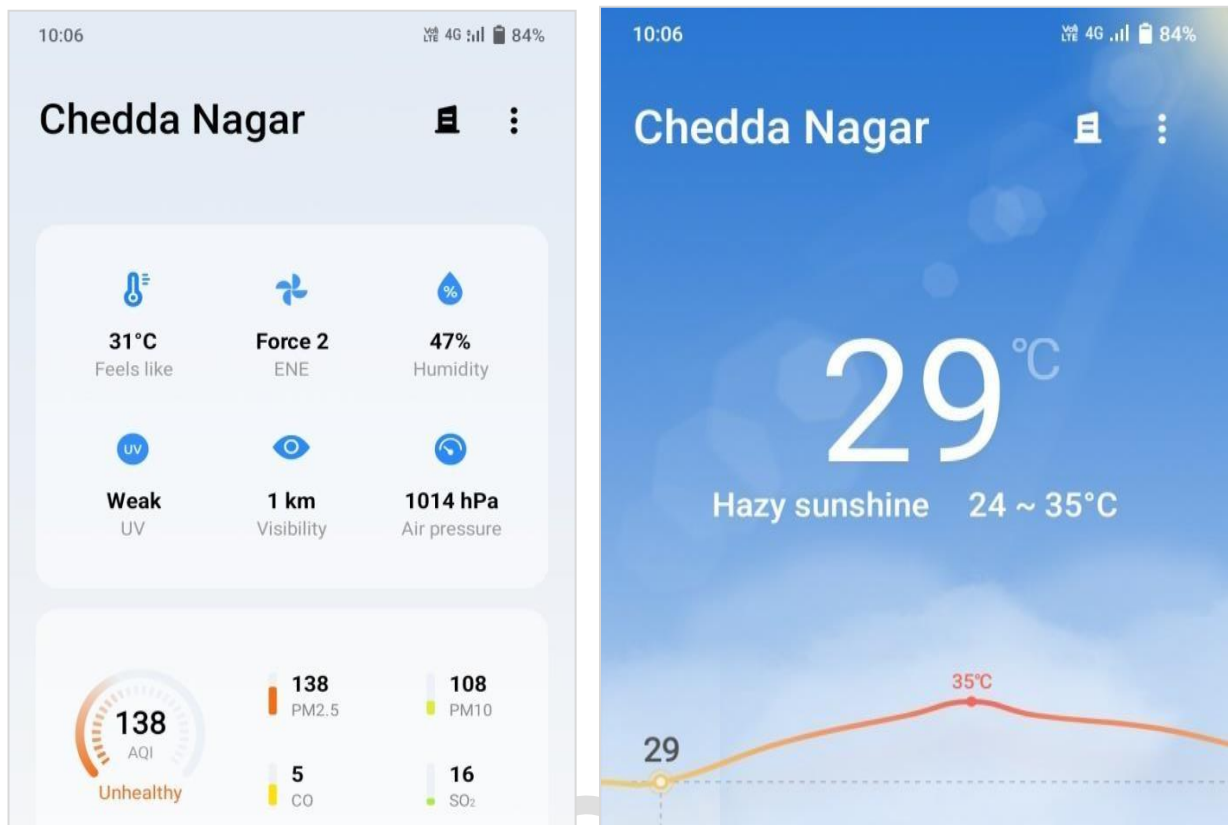


Figure 2: Study at Office (Internal area) – Air conditioned space

The details are noted below:

- ➔ Micro-climate temperature of site in Degree Celsius – 29
- ➔ Particulate matter 2.5 micrometres or less in diameter (PM_{2.5}) – 138
- ➔ Particulate matter 10 micrometres or less in diameter (PM₁₀) – 108
- ➔ Carbon Monoxide (CO) – 5
- ➔ Sulphur dioxide (SO₂) – 16

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3. Terrace (Open area) @ 10:17

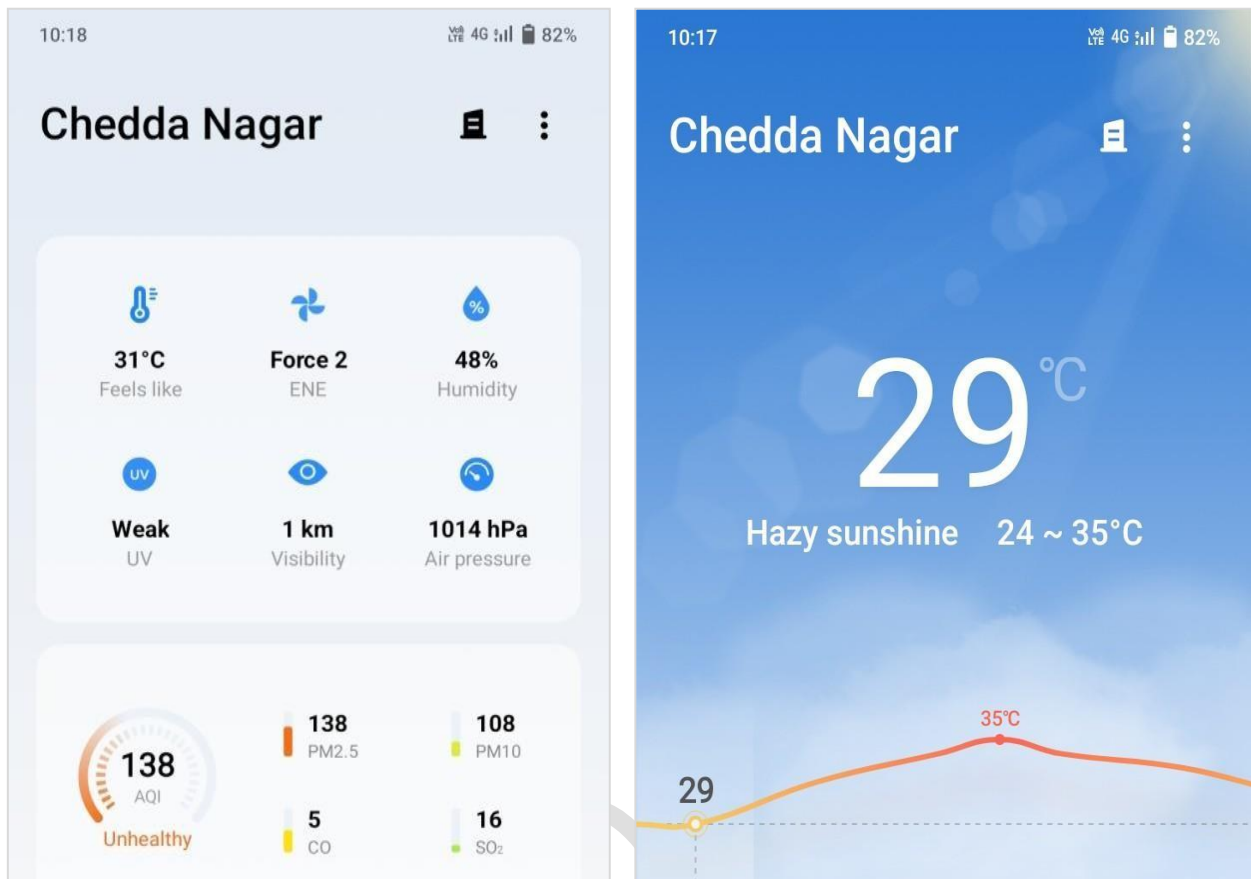


Figure 3: Study at terrace (open area)

The details are noted below:

- ➔ Micro-climate temperature of site in (degree Celsius) – 29
- ➔ Particulate matter 2.5 micrometres or less in diameter (PM_{2.5}) – 138
- ➔ Particulate matter 10 micrometres or less in diameter (PM₁₀) – 108
- ➔ Carbon Monoxide (CO) – 5
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4.2 Macro level study (comparative)

This study is the combined study of all the micro-studies taken place in previous section to draw a specific conclusion of overall AQI.

S. No.	Space	AQI	Requires improvement
1.	Stilt area @ 08:31	136	This is positively taken into consideration by the institution.
2.	Office - Internal area (Air conditioned space) @ 10:06	138	This is positively taken into consideration by the institution.
3.	Terrace (Open area) @ 10:17	138	This is positively taken into consideration by the institution.

Table 2: Macro level study of the site - AQI parameters

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5. Documentation

5.1 Ecological audit

This refers to the green cover of the premises. As compared to last years study there has been an improvement that is increase in the plantations as observed.

5.2 Biodiversity audit

5.2.1 Flora audit

The institution has a good flora cover.

5.2.2 Fauna audit

The institution takes steps in preserving the fauna in the premises.

5.3 Carbon Footprint audit

5.3.1 Heat Island Reduction

The site requires upgrade in this aspect. Since the campus is surrounded with huge concertized buildings, construction work and city infrastructure there has been a haphazard situation on a city level that impacts the pollution levels of the site.

- ➔ **Positive aspects** – Increased green cover and light colored exteriors
- ➔ **Negative (Improvement aspects)** - Withering of roof (Terrace)

5.3.2 Pollution study

5.3.2.1 Light pollution

This type of pollution is not experiences within premises

5.3.3 Air pollution

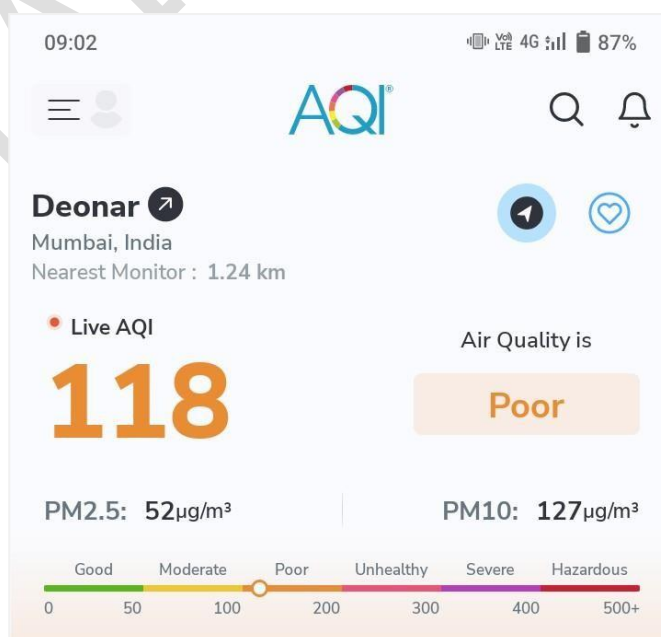


Plate 3: AQI study - Macro level from a carbon footprint aspect

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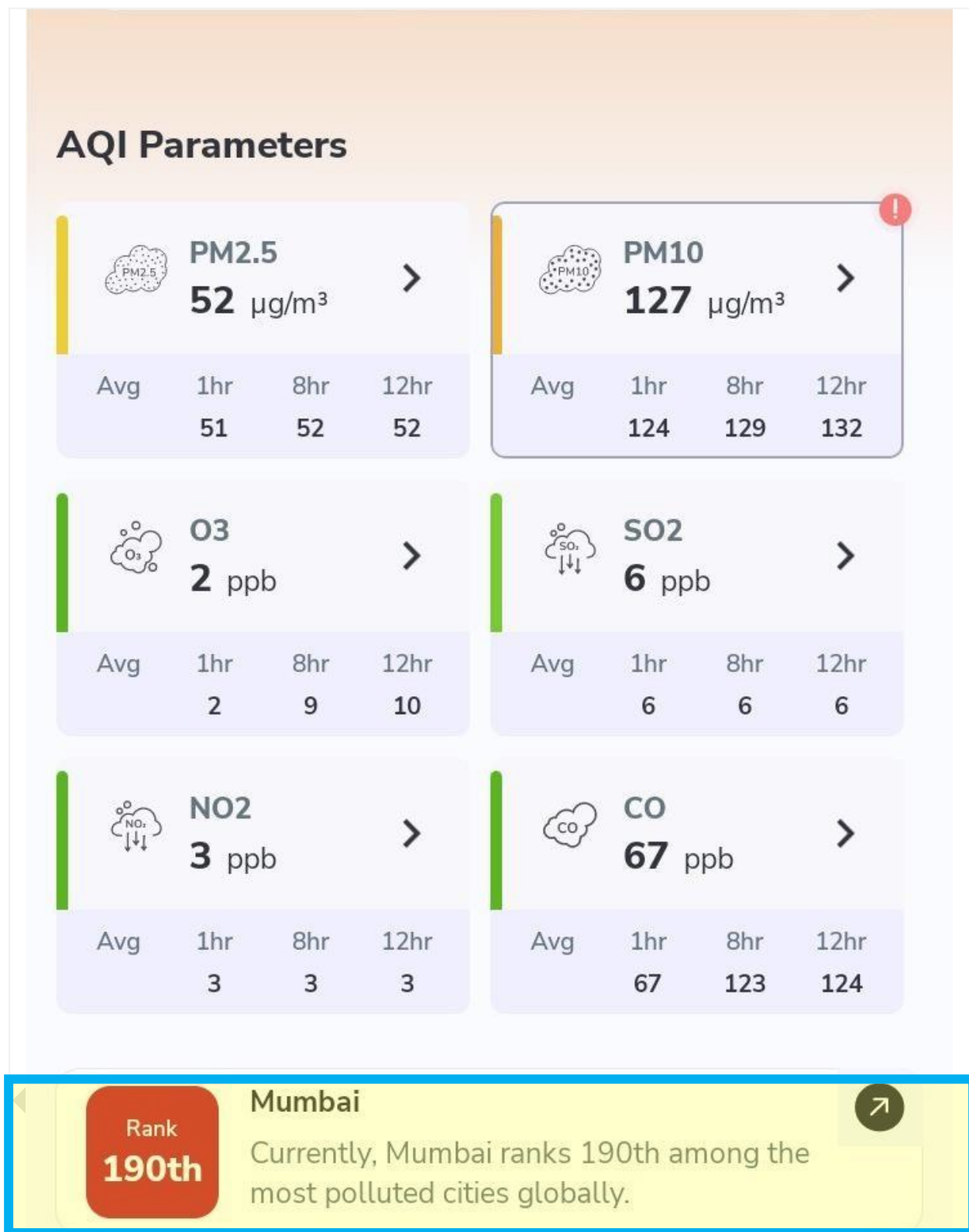


Plate 4: Macro level study continued

As per above study through the AQI software (Referring to the blue highlighted box) Mumbai is considered among polluted cities.

5.3.3 Carbon dioxide study

5.3.3.1 Description study

How is carbon dioxide related to indoor air quality? ^

Background: **Associations of higher indoor carbon dioxide (CO₂) concentrations with impaired work performance, increased health symptoms, and poorer perceived air quality** have been attributed to correlation of indoor CO₂ with concentrations of other indoor air pollutants that are also influenced by rates of outdoor-air ...

[pmc.ncbi.nlm.nih.gov > articles > P...](http://pmc.ncbi.nlm.nih.gov/articles)

Is there a correlation between humidity and CO₂? ^

This shows that either the dispersion/emissions of carbon dioxide decreases with rise in temperature and **increases with increase in relative humidity.**

[www.researchgate.net > publication](http://www.researchgate.net)

Plate 5: Justifications about carbon dioxide

5.3.3.2 Investigation study on stilt area @ 09:09



Plate 6: Humidity study conducted on site with software

As per Condair "The recommended relative humidity range is 40 – 60% in dwellings and air conditioned buildings, 40 –70% elsewhere." Since the result as per above investigation is 47% the limit is within range and good.

5.3.3.3 Summary study

An observation was conducted, as there have been renovation works undertaken no rusting/corrosion was observed. As per article Getting the Rust Out - Humidity and Corrosion, July 26, 2019 by LATEM Industries "Atmospheric corrosion can occur when the amount of moisture in the air reaches critical humidity this happens at 80% relative humidity (RH)."

As the result is 47% which is less than 80% and as per observation it can be stated on building (Corrosion study) the CO₂ is not having any direct negative impact.

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5.4 Noise Audit

This study is conducted within site premises.

5.4.1 Micro level study (Detail)

1. Stilt area @ 08:31

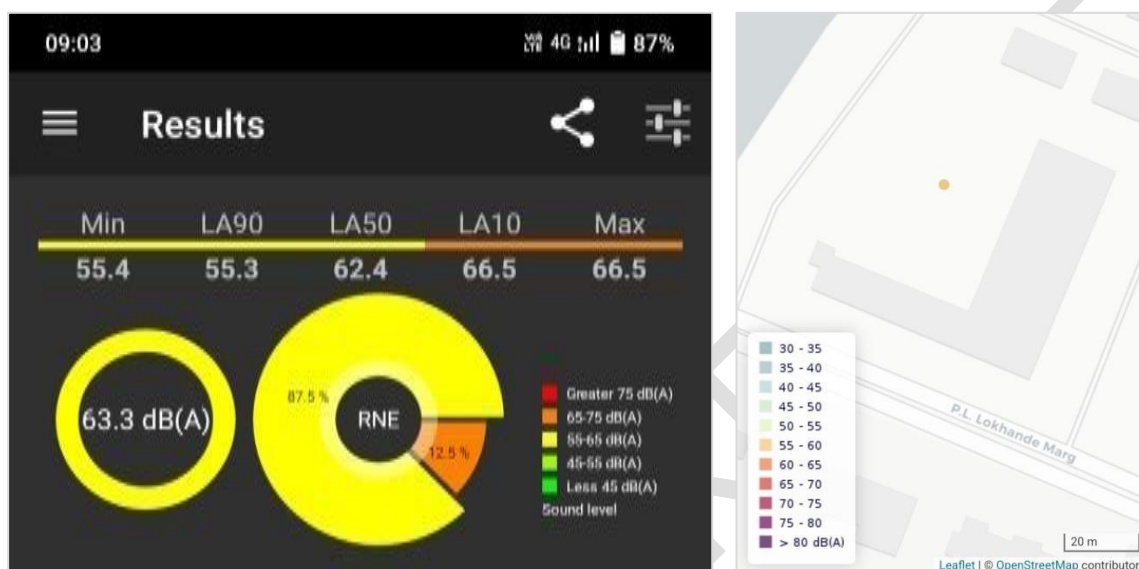


Figure 4: Noise study at stilt area

2. Office - Internal area (Air conditioned space) @ 10:06



Figure 5: Noise study at Office - Internal area (Air conditioned)

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3. Terrace (Open area) @ 10:17

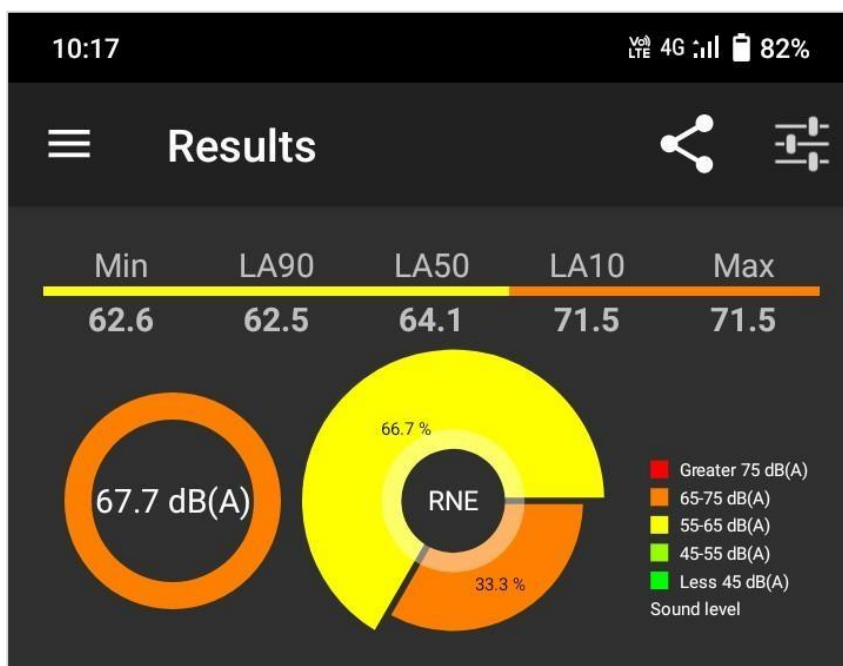


Figure 6: Noise study at terrace (Open area)

5.4.2 Macro level study (comparative)

S. No.	Space	Actual Noise (dB)	Max. Noise (dB)	Requires improvement
1.	Stilt area @ 08:31	63.3	50	YES - To be improved
2.	Office - Internal area (Air conditioned space) @ 10:06	59.3	50	YES - To be improved
3.	Terrace (Open area) @ 10:17	67.7	50	YES - To be improved

Table 3: Summary study of the noise

The above study was conducted using the NoiseCapture software.

As the above study shows the sampling carried in three five areas is more than required decibels, the reason could be close proximity to external roads, construction going on in nearby areas.



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6. 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 was for June 2021 to May 2022 and June 2022 to May 2023
- ➔ Renewal study currently done is for June 2023 to May 2024

7. Suggestion

The suggestion (inference) would act as a „PLAN OF ACTION“ to implement all the suggestions in a detailed manner.

- ➔ Conduct the „Before“ and „After“ study with photos
- ➔ Document the same in „Action taken report“

S. No.	Location/ Aspect	Evidence	Suggestion
1.	Cool rooftops		<p>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.</p> <p>Introduce signboards about „No students are allowed to enter“</p> <p>Undertake feasibility study of before - after temperature reading.</p>

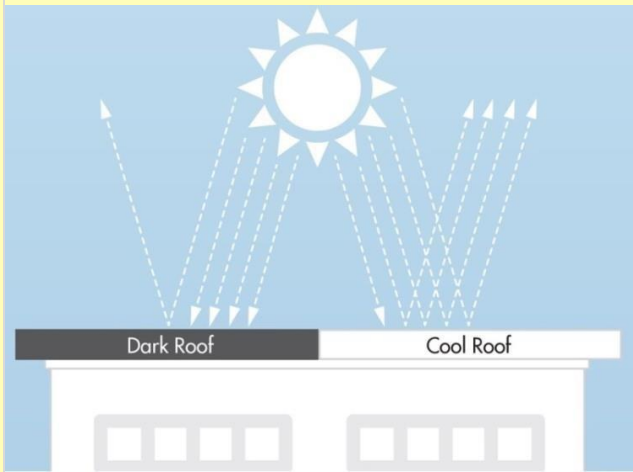

			 <p>Plate 7: Cool roof comparative analysis (For reference purpose only) Source: Image by https://www.gaf.com/en-us/blog/six-truths-about-cool-roofs-281474980105387</p>
2.	Display Restricted zone		Remove any kind of storage material near the access of terrace and introduce a signboard „Restricted zone“ Entry only with permission
3.	Display Silent zone	N.A.	The study suggests that outside the campus a signboard could be displayed that highlights „Silent zone“ and „No honking zone“ being an Educational Institute.
4.	Document Numbering the plants	N.A.	Numbering every plantation can be undertaken

Table 4: Observation based suggestion study of the campus

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8. 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>
- ➔ Condaire CO₂ study <https://www.condaire.co.in/news/industry-guidelines-and-regulations-on-indoor-humidity#:~:text=%22The%20recommended%20relative%20humidity%20range,40%20%E2%80%9370%25%20elsewhere.%E2%80%9D>
- ➔ Corrosion study <https://latem.com/blog/getting-the-rust-out-humidity-and-corrosion#:~:text=Metal%20corrodes%20at%20a%20much,faster%20they%20will%20generally%20corrode.>

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