

# ENVIRONMENT AUDIT

STUDY PERIOD (ONE YEAR) 2023 - 2024

Sustainability study

## AUDIT REPORT

CMR Technical Education Society's

**CMR Technical Campus**

Kandlakoya Village, Medchal Road,  
Hyderabad- 501401, Telangana, India

Studied in the capacity of

Accredited and Certified

Green Building Professional



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# Disclaimer

The Audit Team has prepared this report for **CMR Technical Education Society's CMR Technical Campus** located at Kandlakoya Village, Medchal Road, Hyderabad- 501401, Telangana, 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**

**Greenvio Solutions**

*Developing Healthy and Sustainable Environments*

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## Acknowledgement

The Audit Assessment Team extends its appreciation to **CMR Technical Education Society's CMR Technical Campus, Telangana** 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 " To Impart quality education in serene atmosphere thus strive for excellence in Technology and Research."

### 1.1.2 Mission

The Institute adheres and focuses

- To create state of art facilities for effective teaching- learning process.
- Pursue and disseminate knowledge based research to meet the needs of industry & society.
- Infuse professional, ethical and societal values among learning community.

# 2. Overview

## 2.1 Summarised Populace analysis for 2023-24

### 2.1.1 Students data

The data (shared by Institute) shows there were 4,832 students.

### 2.1.2 Staff data

Sl. No.	Particulars	Male	Female	Total
1	Admin Staff	08	04	12
2	Teaching Staff	153	138	291
3	Non-teaching Staff	45	15	60
<b>Total</b>		<b>206</b>	<b>157</b>	<b>363</b>

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

Above data documents 363 staff members.

**Thus, total populace stands at 5,195 nos.**

### 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: CMR Technical Campus Date: 4-12-2024

**Document objective: Inferences of the Site visit**

Observations (Positive aspects)	Suggestions (Improvement aspects)
<b>Green Audit</b>	
<ul style="list-style-type: none"> <li>- Drinking water levels within norms 27.</li> <li>- NSS works actively for innumerable activities</li> </ul>	<ul style="list-style-type: none"> <li>- Healthy zone &amp; 'No Smoking &amp; No Tobacco zone' documentation &amp; reflectance</li> </ul>
<b>Energy Audit</b>	
<ul style="list-style-type: none"> <li>- Better measure for rooftop taken &amp; temperature is fair 28°C</li> <li>- 100% solar capacity fulfilled</li> </ul>	<ul style="list-style-type: none"> <li>- Safety &amp; danger zone for restricted &amp; high electrical zone</li> </ul>
<b>Environment Audit</b>	
<ul style="list-style-type: none"> <li>- AQI is 62 scope for improvement</li> </ul>	<ul style="list-style-type: none"> <li>- Oxygen zone through shake &amp; spider plants</li> <li>- IoT for smart gardening</li> </ul>


*Ameddy*

Signature & round seal

Name: Dr. A. Rajibeddy

Designation: Director

**For the said Institute**




*Mrs. S. S. Shaikh*

Signature & round seal


Name: Mrs. S. S. Shaikh

Designation: Project Coordinator

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**Plate 1: Evidence files related to inferences**

### 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: CMR Technical Campus Date: 4.12.2024

Document objective: Proof of the Site visit



Meeting with the core team



Investigation of the systems

*Armeddy*

Signature & round seal

Name: Dr. A. Rafi Reddy

Designation: Director

For the said Institute



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Name: Mrs. R. Shaikh

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Plate 2: Evidence files related to investigation

## 4. Investigation

The following results were carried out during visit on **04 December 2024**.

### 4.1 Micro-site study

#### 1. Testing @ 12:40

The details are noted below:

- Micro-climate temperature of site in Degree Celsius – 27
- Particulate matter 2.5 micrometres or less in diameter (PM<sub>2.5</sub>) – 62
- Particulate matter 10 micrometres or less in diameter (PM<sub>10</sub>) – 44
- Carbon Monoxide (CO) – 2
- Sulphur dioxide (SO<sub>2</sub>) – 4
- **As per the application the AQI was 62 and found to be 'Poor'**

#### 2. Testing @ 12:50

The details are noted below:

- Micro-climate temperature of site in Degree Celsius – 27
- Particulate matter 2.5 micrometres or less in diameter (PM<sub>2.5</sub>) – 62
- Particulate matter 10 micrometres or less in diameter (PM<sub>10</sub>) – 44
- Carbon Monoxide (CO) – 2
- Sulphur dioxide (SO<sub>2</sub>) – 4
- **As per the application the AQI was 62 and found to be 'Poor'**

#### 3. Testing @ 13:18

The details are noted below:

- Micro-climate temperature of site in Degree Celsius – 28
- Particulate matter 2.5 micrometres or less in diameter (PM<sub>2.5</sub>) – 62
- Particulate matter 10 micrometres or less in diameter (PM<sub>10</sub>) – 44
- Carbon Monoxide (CO) – 2
- Sulphur dioxide (SO<sub>2</sub>) – 4
- **As per the application the AQI was 62 and found to be 'Poor'**



## 4.2 Macro summary study

### 4.2.1 Institute level

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	Result	Requires improvement
1.	Testing @ 12:40 D Block Auditorium on third floor	62	Poor	Yes – To be improved
2.	Testing @ 12:50 K. Block	62	Poor	Yes – To be improved
3.	Testing @ 13:18 ABC combined block terrace and fourth floor with less time difference	62	Poor	Yes – To be improved

**Table 2: Macro level study of the site – AQI parameters**

*The above study was conducted using the HuaFeng Accuweather software.*

As the above study shows the sampling carried in all areas following are major observations:

- ➡ The AQI is 'Poor' in all areas

## 5. Documentation

### 5.1 Ecological audit

The campus is well divided into built and open spaces, courtyard, green pavers with open to sky courtyards etc.



*Plate 3: Courtyard spaces*

### 5.2 Biodiversity (Flora) audit

The provided information is documented below:

S. No.	Plant name	Type	Nos.	Planted by
1	<i>Neem</i>	Tree	75	Planted by staff, students
2	<i>Banyan</i>	Tree	5	Planted by staff, students
3	<i>Alexandrapalm</i>	Tree	43	Planted by staff, students
4	<i>Indian Beach</i>	Tree	9	Planted by staff, students
5	<i>Japaneseholly</i>	Tree	1	Planted by staff, students
6	<i>Sacredfig</i>	Tree	2	Planted by staff, students
7	<i>Peacocksplume</i>	Tree	45	Planted by staff, students
8	<i>Glossyprivet</i>	Tree	4	Planted by staff, students
9	<i>Africantuliptree</i>	Tree	12	Planted by staff, students
10	<i>Falseindigo Bush</i>	Tree	1	Planted by staff, students
11	<i>Whitefrangipani</i>	Tree	4	Planted by staff, students
12	<i>Asoka Tree</i>	Tree	39	Planted by staff, students

13	<i>Eriumoleander</i>	Plant	1	Planted by staff, students
14	<i>Crepejasmine</i>	Plant	10	Planted by staff, students
15	<i>Rose</i>	Plant	15	Planted by staff, students
16	<i>Bushallamanda</i>	Plant	1	Planted by staff, students
17	<i>Arabianjasmine</i>	Plant	2	Planted by staff, students
18	<i>Egyptianstar-Cluster</i>	Plant	8	Planted by staff, students
19	<i>Ipomoeaquamoclit</i>	Plant	1	Planted by staff, students
20	<i>Chrysanthemunindicum</i>	Plant	bushes	Planted by staff, students
21	<i>Spider Plant</i>	Plant	bushes	Planted by staff, students
22	<i>Americantrumpetvine</i>	Bushes	27	Planted by staff, students
23	<i>Muntingiacalabura</i>	Bushes	4	Planted by staff, students
24	<i>Myrobalan</i>	Bushes	1	Planted by staff, students
25	<i>Callistemonhybridus</i>	Bushes	bushes	Planted by staff, students
26	<i>Purpleleafsandcherry</i>	Bushes	bushes	Planted by staff, students
27	<i>Copperleaf</i>	Bushes	bushes	Planted by staff, students
28	<i>Sagocycad</i>	Bushes	25	Planted by staff, students
29	<i>Kadam</i>	Bushes	15	Planted by staff, students
30	<i>Beachspiderlily</i>	Bushes	bushes	Planted by staff, students
31	<i>Red-Magineddracarena</i>	Bushes	10	Planted by staff, students
32	<i>Japaneses spindle</i>	Bushes	3	Planted by staff, students
33	<i>Theladypalm</i>	Bushes	13	Planted by staff, students
34	<i>Fichusthonningii</i>	Bushes	56	Planted by staff, students
35	<i>Bambooleaf</i>	Bushes	bushes	Planted by staff, students
36	<i>Bluetlumbago</i>	Bushes	bushes	Planted by staff, students
37	<i>Whitecheese Wood</i>	Bushes	3	Planted by staff, students
38	<i>Malabarnut</i>	Bushes	1	Planted by staff, students
39	<i>Chinesejuniper</i>	Bushes	5	Planted by staff, students
40	<i>Illexchinensis</i>	Bushes	6	Planted by staff, students
41	<i>Custardapple tree</i>	Bushes	3	Planted by staff, students
42	<i>Mangotree</i>	Bushes	2	Planted by staff, students
43	<i>Coconut tree</i>	Bushes	55	Planted by staff, students
44	<i>Guava tree</i>	Bushes	5	Planted by staff, students
45	<i>Badam tree</i>	Bushes	20	Planted by staff, students

46	<i>Berry</i>	Bushes	5	Planted by staff, students
47	<i>Tulasi</i>	Bushes	1	Planted by staff, students
48	<i>Plumeria</i>	Bushes	6	Planted by staff, students
49	<i>Coco Tree</i>	Bushes	3	Planted by staff, students
50	<i>Acalypha</i>	Bushes	43	Planted by staff, students
51	<i>Weeping Fig</i>	Plant	23	Planted by staff, students
52	<i>Chinese Ixora</i>	Bushes	33	Planted by staff, students
53	<i>Albizia Lebelle</i>	Tree	27	Planted by staff, students

**Table 3: Details about the flora in the campus**

As per above study there are 673 nos. of plantations in the premises.

Previously, there were 600 nos. of plantations there has been a rise of 73 nos.



**Plate 4: Flora of the premises**



## 5.3 Carbon Footprint Audit - Heat Island Reduction

### 5.3. Light pollution study

This type of pollution is not experienced within premises

### 5.3.2 Heat Island Reduction

The heat island effect refers to the study of micro climatic feature within a site. There are multiple factors that add on to feature such as external temperature, internal temperatures, site context including available and site adjacent facilities. Observed features include:

- ➔ Light colored terrace areas
- ➔ Light color facades
- ➔ Ground cover
- ➔ Green paver blocks



**Plate 5: Elements related to heat island reduction**

## 5.4 Noise Audit

This study is conducted within site premises.

### 5.4.1 Macro level summary inputs

S. No.	Space	Actual Noise (dB)	Max. Noise (dB) as per norms	Requires improvement
1.	Testing @ 12:40 D Block Auditorium on third floor	68.6	50	YES - To be improved
2.	Testing @ 12:50 K. Block	50.4	50	NO
3.	Testing @ 13:18 ABC combined block terrace and fourth floor with less time difference	55.6	50	Not really

**Table 4: Summary study of the noise**

*The above study was conducted using the NoiseCapture software.*

As the above study shows the sampling carried in all areas following are major observations:

- ➡ The noise levels are fair enough

## 5.5 Site audit (Amenities perspective)

The following amenities were observed for stakeholder assistance in the campus.



**Plate 6: Speed breaker and Shoe racks in the premises**


## 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

### 6.1 Compliance status in form of Action taken report

The inputs are documented below.

UGC AUTONOMOUS Accredited by NBA & NAAC with 'A' Grade Approved by AICTE, New Delhi and JNTU Hyderabad	ESTD: 2009 
<b>Environment Audit Action Taken Report</b>	
<p><b>6. Suggestion</b></p> <p><b>6.1 Section-wise suggestions</b></p> <p><b>Extra care for the rooftop areas</b></p> <ul style="list-style-type: none"> <li>Introduce the signboards about No students are allowed to enter this area"</li> <li>Upgrade the space as cool roof by painting it with cool top material.</li> <li>Undertake feasibility study of before and after temperature reading.</li> <li>Take precautions to keep terrace areas free of any kind of storage materials</li> </ul> <p><b>Action Taken:</b></p> <ul style="list-style-type: none"> <li>Entry restriction boards have been placed at confidential areas to ensure controlled access.</li> <li>The Institute has a rooftop solar panel system, which helps keep the top roof cool.</li> </ul> <p><b>Messages on the beam area Include quotes and messages from eminent personalities all over the premises on beam for inspiration and beautification.</b></p> <p><b>Action Taken:</b></p> <ul style="list-style-type: none"> <li>CMRTC has been following the practice of displaying inspirational quotes and messages from eminent personalities on beams throughout the premises for beautification. These messages have been strategically placed at prominent locations for continuous motivation.</li> </ul> <p><b>Inspirational timelines on the blank interior facades Include quotes-messages, timelines, details about specific subject or career prospects in the interior areas for inspiration and beautification.</b></p> <ul style="list-style-type: none"> <li>Charts are placed at prominent locations, and as per the suggestion, they will be installed in additional areas to enhance their reach and impact.</li> </ul>	



### General aspects

- Introduce zone wise details at relevant locations
- Introduce information boards everywhere.
- Placards and manuals for awareness.
- Upgrade the website w.r.t. green initiatives.

As per the suggestion, various zones have been introduced on campus, such as a Food Zone, No Hawking Zone, Recreation Zone, and other.

## 6.2 General suggestions

### 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.
- **Action Taken:**  
Implemented and monitored by NCC of CMRTC
- **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.
- **Action Taken:**  
Implemented and monitored by NCC of CMRTC
- **Garden development**
  - Existing space can be designed as an Architectural landscape. - 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.
  - 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.
- **Action Taken** Names for the plants have already been provided, and the remaining initiatives will be implemented in the coming years.



- **Architectural landscape and streetscape features such as:**

- Speed limit signage
- Speed breakers
- Parking mirror
- Bollards with lighting for safety and landscape
- No parking signboards at dedicated locations

**Action Taken:** All these measures have been implemented wherever necessary to ensure safety and proper management.

### 6.2.3 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.

- **Safety for scientific laboratory**

- These areas should have sand buckets, ventilators, fire extinguisher as per required grade, fire and life safety notice board.

- **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.

- **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




**Action Taken:** All these measures have been implemented wherever necessary to ensure safety and proper management; however, the maintenance monitoring system needs improvement.

## 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.	Aspect with evidence if any	Suggestion
1.	Ecological aspect <u>Aspect area:</u> <b>Plant as an extension of 'Green motto'</b>	External resource persons visiting the premises can share the goal of green environment in the following ways: <ol style="list-style-type: none"> <li>1. Plant a sapling within the premises</li> <li>2. Handover a sapling as a gesture</li> </ol>
2.	Ecological aspect <u>Aspect area:</u> <b>Improve green cover</b>	Improve ecological cover and cleanliness in backyard, spaces between buildings and canteen areas 
3.	Biodiversity aspect <u>Aspect area:</u> <b>Numbering the plantations in the premises</b>	Make a list of all the plantations in the premises and start numbering the plantations in either of the ways: <ol style="list-style-type: none"> <li>1. Paint the nos. on iron plates and nail the same</li> <li>2. Print nos. on paper, laminate and paste the same</li> <li>3. Paint the nos. directly</li> </ol> <p>Sample image for 3 examples are noted below.</p>

		 <p><i>Options for numbering the plantations</i></p> <p>Care should be taken that the display should be visible.</p> <p>Uniform color palette should be identified and used.</p> <p>Measures should be taken to avoid withering during monsoon.</p> <p>This could be undertaken as a student activity.</p>
4.	Carbon footprint aspect <b>Aspect area:</b> <b>Environment monitoring</b>	Install CO <sub>2</sub> monitor in public areas of indoor areas such as porch and AQI meter in outdoor areas near compound wall
5.	Noise aspect <b>Aspect area:</b> <b>Demark &amp; display board about Silent zone</b>	<p>A signboard highlighting and 'No honking or Silent zone' should be displayed outside campus near all entrance gates; near roadside approach of site (Outdoor areas) and 'Quite zone' outside the library space (Indoor areas)</p> <div>   </div>
6.	General <b>Aspect area:</b> <b>Demark &amp; display board about zones</b>	<p>Intrdouce display board and signaboard about:</p> <ul style="list-style-type: none"> <li>➔ Oxygen zone</li> <li>➔ Restricted zone</li> </ul>

7.	Site aspect <u>Aspect area:</u> <b>Beautification</b>	Improve speed breakers  Current status is:  
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*Table 5: Observation based suggestion study of the campus*

DETAILED REPORT



## 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>

