

# Environmental Audit Report

For

Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering  
(YCCE)**

Institute Code : 4167

NAAC Accredited with 'A++' Grade  
(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Session- 2022-23



Report By

**Dr. Harshal Madhukar Warade**

Team Lead & Lead Auditor- TUV Nord

ISO-14001:2015 EMS

Dept. of Civil Engineering, YCCE Nagpur

Certificate No.- 35325443 01r



Nagar Yuwak Shikshan Sanstha's  
**Yeshwantrao Chavan College of Engineering  
(YCCE)**

Institute Code : 4167



NAAC Accredited with 'A++' Grade  
(An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

## Department of Civil Engineering

### Certificate

This is to certify that an "**Environmental Audit**" for Yeshwantrao Chavan College of Engineering, Hingna Nagpur has been conducted for session 2022-23 to assess the Environmental Components: Water, Air, Soil, Weather and Climate, Vegetation and Fauna, Sound Level, Energy, Waste- Institutional Municipal Solid Waste and Wastewater, Fire and Safety, Land use Land Cover and the Eco-friendly initiatives implemented within the college campus.

**Place:- Nagpur**

**Date:- 20/02/2024**



**Dr. Harshal M. Warade**

Team Lead & Lead Auditor

ISO-14001:2015-EMS

Department of Civil Engineering  
Y. C. College of Engineering  
Nagpur - 441 110



**PR315: ISO 14001:2015 Lead Auditor  
(Environmental Management Systems)  
Training course**

**Certificate of Achievement**

**Harshal Warade**

has successfully passed all the course assessment requirements.

18th - 19th & 24th - 26th June 2022

INDIA

Certificate No. 35325443 01r

Unique Learner No. 416166



Katja Beyer  
for TÜV NORD CERT GmbH

Essen, 2022-11-30

**Note:** The course is certified by CQI and IRCA (Certification No. 18125). The learner meets the training requirements for those seeking certification under the IRCA EMS Auditor certification scheme. The certificate is valid for 5 years, starting from the last day of the course, for the purpose of IRCA auditor certification.

TÜV NORD CERT GmbH

Am TÜV 1

45307 Essen

[www.tuev-nord-cert.com](http://www.tuev-nord-cert.com)



## Content

S.N.	Description	Page No.
1.0	Introduction	01
1.1	Institute Details	04
1.2	About College	05
2.0	Green Audit	09
2.1	Introduction	09
2.2	Objectives of Green Audit	09
2.3	Few key components under Green Audit	10
2.4	Procedure for conducting Green Audit	11
2.5	Area Statements	12
3.0	Water Audit	19
3.1	Indian Standards Specifications for Drinking Water	20
3.2	Sewage Effluent Generation	31
3.3	Rainwater Harvesting Potential at YCCE	31
4.0	Air Audit	35
5.0	Weather & Climate Audit	40
6.0	Soil Audit	43
7.0	Vegetation Audit: Flora Diversity	48
8.0	Vegetation Audit: Fauna Diversity	63
9.0	Energy Audit: Electric Energy	67
10.0	Energy Audit: Solar Energy	79
11.0	Vehicle Audit	81
12.0	Sound Audit	83
13.0	Waste Audit: Institutional Municipal Solid Waste	88
13.1	Institutional Municipal Solid Waste Management Plan	90
13.2	E-Waste Management	92
14.0	Waste Audit- Municipal Sewage	93
15.0	Waste Audit- Sanitation Utilities	101
16.0	Fire and Safety Audit	107
17.0	Green Initiatives/ Activities in Campus	136
18.0	Overall Recommendations	140

## List of Images

S.N.	Description	Page No.
1.	Image No. 1: Map of YCCE Campus	02
2.	Image No. 2: Green Campus of YCCE	03
3.	Image No. 3: Organization Structure of YCCE	08
4.	Image No. 4: Methodology on Key Components of Green Audit	11
5.	Image No. 5: Area under Vegetation Cover	13
6.	Image No. 6: Marked Boundary Area of YCCE campus	15
7.	Image No. 7: Satellite image of YCCE campus	15
8.	Image No. 8: Building infrastructures of YCCE campus	16
9.	Image No. 9: Water sources within YCCE campus	20
10.	Image No. 10: Sample Report of Water Testing	25
11.	Image No. 11: Water Dispensing units in YCCE Campus	30
12.	Image No. 12: Sampling Locations of Air Component	37
13.	Image No. 13: Sampling Locations of Weather & Climate Component	41
14.	Image No. 14: Sampling Locations of Soil Component	44
15.	Image No. 15: Locations of Vegetation Component (Medicinal Species)	49
16.	Image No. 16: Locations of Vegetation Component (Ornamental Species)	49
17.	Image No. 17: Locations of Vegetation Component (Shrubs Species)	50
18.	Image No. 18: Locations of Vegetation Component (Tree Species)	50
19.	Image No. 19: Locations of All Vegetation in Campus	51
20.	Image No. 20: Vegetation Pics in the Campus	51
21.	Image No. 21: Sampling Area for Fauna Audit	64
22.	Image No. 22: Solar Rooftop setup at YCCE	80
23.	Image No. 23: Locations of Sound Component	83
24.	Image No. 24: Institutional Municipal Solid Waste Pit	88
25.	Image No. 25: Solid Waste pit at YCCE	89
26.	Image No. 26: Location of Sewage Treatment Plant	94

27.	Image No. 27: Sewage Treatment Plant Design and Description	94
28.	Image No. 28: Sewer Line Drainage Map	95
29.	Image No. 29: Layout Plan of Sewage Treatment Plant	95
30.	Image No. 30: STP at YCCE	97
31.	Image No. 31: Sample Report of Waste water testing	99
32.	Image No. 32: Sample Report of Waste water testing	100
33.	Image No. 33: Fire system at YCCE	108

## List of Tables

S.N.	Description	Page No.
1.	Table No. 1: Area description of Study Region	13
2.	Table No. 2: Area segments-Total Built-up and Green Area at YCCE	13
3.	Table No. 3: Department wise built-up Area at YCCE	14
4.	Table No. 4: Infrastructure of YCCE	14
5.	Table No. 5: Organoleptic and Physical Parameters	21
6.	Table No. 6: General Parameters of Substances Undesirable in Excessive Amounts	22
7.	Table No. 7: Parameters Concerning Toxic Substances	23
8.	Table No. 8 : Bacteriological Quality of Drinking Water	23
9.	Table No. 9: Qualitative & Quantitative Parameters of Drinking Water Source at YCCE campus	24
10.	Table No. 10: Water Source at YCCE: I] Maharashtra Industrial Development Corporation (MIDC)	26
11.	Table No. 11: Water Source at YCCE: II] Maharashtra Jeevan Pradhikaran (MJP)	26
12.	Table No. 12: Availability of Drinking Water Systems	27
13.	Table No. 13: Department-wise Water Tank Provision	28
14.	Table No. 14: Water Dispensing Connectivity	29
15.	Table No.15: Monthly Rainfall Data of Nagpur City	32
16.	Table No. 16: Calculation of Rooftop Area of All Building in YCCE Campus	32
17.	Table No. 17: Annual Rooftop Rainwater Harvesting Potential at YCCE	33
18.	Table No. 18: Annual Water Budget of YCCE	33
19.	Table No. 19: Vehicle data (Department wise)	36
20.	Table No. 20: National Ambient Air Quality Standards	37
21.	Table No. 21: Qualitative and Quantitative Characteristics of Air at different locations at YCCE	38
22.	Table No. 22: Assessment of Air Quality Index (AQI) of YCCE	38
23.	Table No. 23: Qualitative and Quantitative Characteristics of Weather	41

	and Climate at YCCE	
24.	Table No. 24: Standard Soil Classification	45
25.	Table No. 25: Qualitative and Quantitative Characteristics of Soil at YCCE	46
26.	Table No. 26: Vegetation at YCCE: I] Medicinal Species	54
27.	Table No. 27: Relative Density of Medicinal Species	54
28.	Table No. 28: Vegetation at YCCE: II] Ornamental Species	54
29.	Table No. 29: Relative Density of Ornamental Species	55
30.	Table No. 30: Vegetation at YCCE: III] Shrubs Species	57
31.	Table No. 31: Relative Density of Shrub Species	58
32.	Table No. 32: Vegetation at YCCE: IV] Tree Species	59
33.	Table No. 33: Relative Density of Tree Species	61
34.	Table No. 34: Bird Species at YCCE	64
35.	Table No. 35: Insect species at YCCE	65
36.	Table No. 36: Reptile Species at YCCE	65
37.	Table No. 37: Amphibian Species at YCCE	65
38.	Table No. 38: Rodent Species at YCCE	65
39.	Table No. 39: List of Electrical Equipment's at Department of Civil Engg.	69
40.	Table No. 40: List of Electrical Equipment's at Department of Electronics Engg.	71
41.	Table No. 41: List of Electrical Equipment's at Department of Electronics and Telecommunication Engg.	72
42.	Table No. 42: List of Electrical Equipment's at Department of Information Technology Engg.	73
43.	Table No. 43: List of Electrical Equipment's at Department of Old Science	74
44.	Table No. 44: List of Electrical Equipment's at Department of Mechanical Engg.	75
45.	Table No. 45: List of Electrical Equipment's at Department of Electrical Engg.	76
46.	Table No. 46: List of Electrical Equipment's at Admin Building	77
47.	Table No. 47: Monthly utilization of Electricity at YCCE	78



48.	Table No. 48: Carbon Footprint based on Electrical Consumption	78
49.	Table No. 49: Solar Energy Potential and CO2 Emission at YCCE	79
50.	Table No. 50: Details of Vehicle owned by YCCE for Transportation	81
51.	Table No. 51: Vehicle Details	81
52.	Table No. 52: CO <sub>2</sub> emission of single bike	82
53.	Table No. 53: Sound Level Standard	84
54.	Table No. 54: Noise Quality Standards	84
55.	Table No. 55: WHO Guidelines for Sound Level	85
56.	Table No. 56: Quantitative Characteristics of Noise Level at YCCE	86
57.	Table No. 57: Institutional Municipal Solid Waste Generation (IMSW) at YCCE	89
58.	Table No. 58: Sewage Standards	96
59.	Table No. 59: Qualitative and Quantitative Characteristics of Sewage at YCCE	96
60.	Table No. 60: Qualitative & Quantitative Parameters of Recycle Water Source at YCCE	98
61.	Table No. 61: Department-wise Provision of Sanitary Utilities	102
62.	Table No. 62: Building-wise Availability of Fire Safety Systems	107
63.	Table No. 63: Fire Safety Details of CCC Building	109
64.	Table No. 64: Fire Safety Details of Admin Building	111
65.	Table No. 65: Fire Safety Details of Electronics Building	113
66.	Table No. 66: Fire Safety Details of Exam Control Building	115
67.	Table No. 67: Fire Safety Details of IT Building	117
68.	Table No. 68: Fire Safety Details of Mechanical Workshop Building	119
69.	Table No. 69: Fire Safety Details of Old Science Building	121
70.	Table No. 70: Fire Safety Details of Civil Engg. Building	123
71.	Table No. 71: Fire Safety Details of Civil Lab Shed	125
72.	Table No. 72: Fire Safety Details of Mechanical Engg Building	127
73.	Table No. 73: Fire Safety Details of Mechanical Lab. Building	129
74.	Table No. 74: Fire Safety Details of Electrical Engg. Building	131
75.	Table No. 75: Fire Safety Details of CSE Building	133

## **Acknowledgement**

We express our sincere gratitude to Yeshwantrao Chavan College of Engineering Nagpur for giving us the opportunity to be a part of their mission towards sustainable environment.

I am immensely thankful to the resource person from Yeshwantrao Chavan College of Engineering, Dr. U. P. Waghe, Principal YCCE, for proposing the need of this project and their kind consent.

I am deep heartedly thankful to Dr. A. R. Bhagat Patil, Dean & Director IQAC for kind permission and encouragement to work on this project.

I acknowledge my thanks to Dr. S. P. Raut, Head of Department, Civil Engineering, YCCE for always being supportive in every work and activities taken-up at Department.

I am also grateful to Shri. Chetan Wazalwar (Administrative Officer YCCE), Shri. Rajesh Shah (Estate Manager, YCCE), Shri. Madankar and Shri, Mahajan, and the staff at accounts section YCCE for their whole hearted help during data collection in the field and financial provisions for project.

A special thanks and appreciation go to the whole audit team who worked hard for data collection and also during compilation. This project has been possible with the team efforts.

**Dr. Harshal Madhukar Warade**

## **Audit Team**

- 1) Dr. Harshal Madhukar Warade  
(Principal Investigator & Certified Auditor)
- 2) Mr. Anurag Kharkar  
(GIS Computation & Compilation)
- 3) Ms. Vidhi Vijin Kamble  
(Data interpretation & Compilation)
- 4) Mr. Hrishkesh Rajendra Sawarkar  
(Field Data Collection)
- 5) Mr. Meet Rakesh Kurani  
(Field Data Collection)
- 6) Ms. Anushri Nandkumar Satpute  
(Species Exploration)
- 7) Mr. Harshal Sudhir Bawankar  
(Species Exploration)

## 1.0 Introduction

Yeshwantrao Chavan College of Engineering was established in the year 1984 by Nagar Yuwak Shikshan Sanstha, Nagpur. YCCE is the prominent institution acknowledged for remarkable engineering education and research. Since 39 years the institution has magnificently cherished and encouraged the forthcoming engineering professionals across the country making us one of the most opted engineering colleges in Maharashtra.

The college is guided by the Academic Advisory Board consisting of eminent academicians from the prestigious technical institutes in India. YCCE is one of the top engineering colleges in Nagpur that aspires to create devoted, proficient, capable, and resourceful engineers who would utilize their assimilated knowledge and skills for the advancement of the organization as well as the Nation. It is the first private engineering college in Central India to acquire “Autonomous Status”.

The college is becoming a most sought after destination by the students who are aspiring to pursue higher technical education and attain placements in the competitive software and core industries. The institution accentuates on instilling significant professional education for crafting ambitious engineers who would ultimately possess noteworthy qualities to become leaders in their opted profession. The highly educated and well-experienced faculty members focus on inculcating excellent education for creating commendable engineers. The infrastructure and the atmosphere of the institute are completely oriented towards boosting the substantial teaching-learning schema promoting the development of students’ attentiveness towards learning. These factors have ultimately made YCCE as the most ideal and preferred engineering college in Nagpur. The institute is recently reaccredited ‘A++’ Grade with the CGPA of 3.6 by National Assessment and Accreditation Council (NAAC) for a period of five years w.e.f. May 2022 to May 2027. Further, University Grant Commission (UGC), New Delhi has granted Extension of Autonomy status for a period of Ten (10) years from the session 2022-23 to 2031-32.

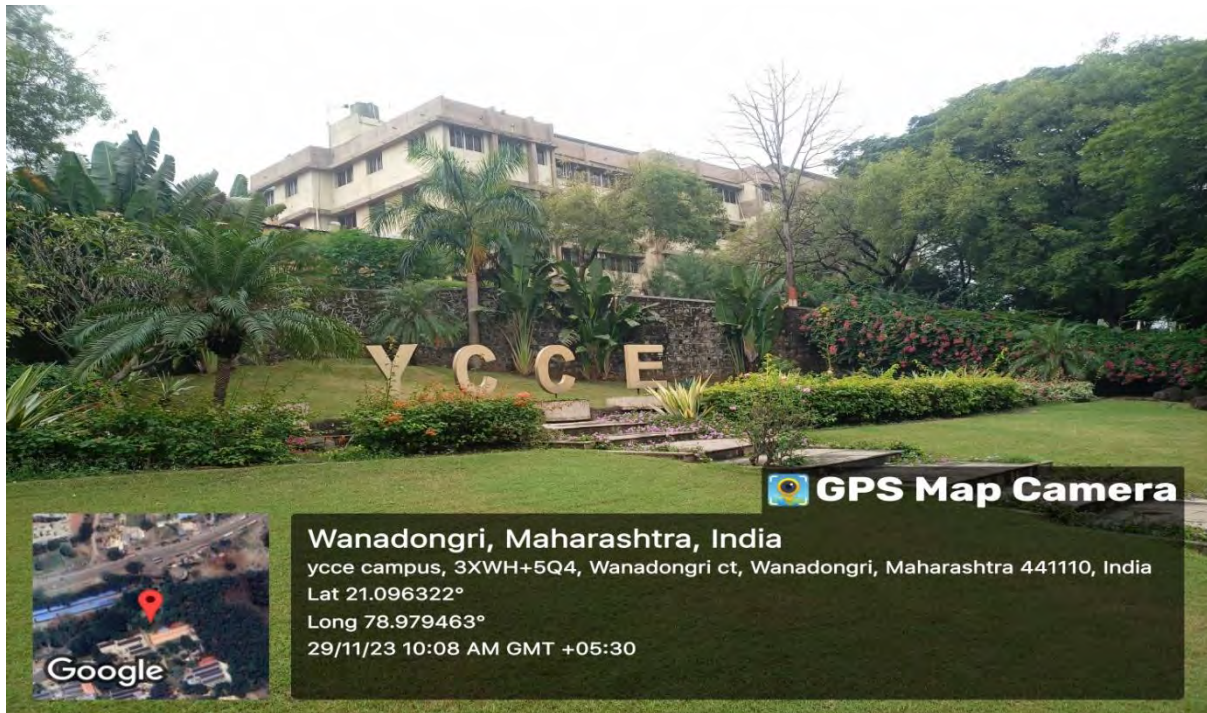
All the departments are approved research centres of Rashtrasant Tukadoji Maharaj Nagpur University with 152 students are awarded for Ph.D. and 82 students have currently registered for Ph.D. programmes in various disciplines, Faculty members have published 102 Patents and 100 National & international patents are granted.

In 2022-23, NIRF declared ranking of 300 Institutions in the country, which includes IIT’s, NIT’s, Govt. Engineering colleges, Autonomous colleges and Self-financed colleges. YCCE

established Siemens Centre of Excellence for digital manufacturing robotics, AVEVA Centre of Excellence and NVIDIA Centre of Excellence for Artificial Intelligence and Machine Learning. Selected by Ministry of Micro, Small and Medium Enterprises, Govt. of India as Technical Business Incubator under ASPIRE scheme and registered 10 startups.

**Image No. 1: Map of YCCE Campus**



**Image No. 2: Green Campus of YCCE**

The infrastructure and the atmosphere of the institute are completely oriented towards boosting the substantial teaching-learning schema promoting the development of students' attentiveness towards learning. These factors have ultimately made YCCE as the most ideal and preferred engineering college in Central India. The institute is awarded with 'A++' Grade of by National Assessment and Accreditation Council (NAAC) for a period of five years 2022-2027.

The Yeshwantrao Chavan College of Engineering, Nagpur is geographically located about at 21.096742 latitude and 78.979402 longitude and is 14.7 Km from Nagpur airport and railway station, on the Nagpur Hingna road. The college campus is located on a lush green hill top area- a barren land 39 years back, and is benefitted with the elevation from adjacent street pollution which leads to reduced air pollution in the college premises.

## 1.1 Institute Details

### Detail Address of the Institute

<b>Yeshwantrao Chavan College of Engineering</b> Hingna Road, Wanadongri, Nagpur- 441110	
State	Maharashtra
Phone	+91-7104-295083, 295085
Phone (Principal office)	+91-7104-295083, 09764996477
Fax	+91-7104-242376
Hostel	+91-7104-242840
Website	www.ycce.edu
Email	principal@ycce.edu , info@ycce.edu

### Detail Address of the Management

<b>Nagar Yuvak Shikshan Sanstha</b> SDMP Campus. Atrey Layout, Pratap Nagar Nagpur – 440 022	
State	Maharashtra

<b>MEGHE GROUP OF INSTITUTIONS</b>	
Regd. Office	Atrey Layout, Pratap Nagar, Nagpur-440 022 (M.S.) INDIA
Phone	+91 712 3295234, 2249462
Fax	+91 712 2220428, 2245318
E-mail	mgingp@gmail.com
Website	www.mginagpur.com

## 1.2 About College

The college is guided by the Academic Advisory Board consisting of eminent academicians from the prestigious technical institutes in India and USA. The college is having well qualified and experienced senior faculty members.

Yeshwantrao Chavan College of Engineering (YCCE) is renowned for Engineering Education and Research. For over 36 years, it has successfully nurtured young engineering professionals, becoming a sought-after destination for students aspiring to higher technical education and placement in the competitive software and core industries. It offers a rare combination of respected scholars, international footprint and interdisciplinary studies.

A premier institute, YCCE became one of the few selected well-performing colleges for Government of India's Technical Education Quality Improvement Program (TEQIP Phase I), funded by the World Bank. With the TEQIP financial aid, the Institution has created state-of-the-art infrastructure, laboratories, computational facilities, library etc.

YCCE has become the First private engineering college to acquire 'Autonomous' status in Central India. Under the new status, the first batch of students commenced their B.E. and M.Tech. courses from the academic session 2010-2011. In the year 2021-22, UGC peer team visited YCCE & granted 'Extension of Autonomy' for 10 years (2022-23 to 2031-32). Quality assurance through Accreditation and Re-Accreditation of UG & PG programs by National Board of Accreditation (NBA), New Delhi Since 2003.

B.Tech. Civil Engg., B.Tech. Electronics & Telecomm. Engg., B.Tech. Electronics Engg. programs are accredited for 6 years from 2023-24 to 2028-29 and B.Tech. Mechanical Engg., and B.Tech. Electrical Engg. Program are accredited for 3 years from 2023-24 to 2025-26 by National Board of Accreditation (NBA), New Delhi. nM.Tech. Structural Engg, M.Tech. Integrated Power System and M.Tech. CAD-CAM are also Accredited by National Board of Accreditation (NBA), New Delhi upto June 2019. Accreditation with 'A++' Grade by UGC National Assessment and Accreditation Council (NAAC), Bangalore. Received ISTE National Award 2014 for being the "Best Private Engineering College" in the Country.

All India 32<sup>nd</sup> Rank, 23<sup>rd</sup> Rank amongst Self-Financing & 4<sup>th</sup> Rank in West Zone by Data Quest-CMR Ranking-2020. All India 134<sup>th</sup> Rank amongst IIT's, NIT's, Government and Autonomous Engineering Institutions by NIRF, MHRD, Govt. of India, 2019.



Ranked amongst Top 150 Engineering Institutions all over India including IITs, NITs, Govt. & Autonomous Engineering Institution by NIRF, MHRD, Govt. of India in 2017 and also in 2018. All India 93rd rank amongst IITs, NITs, Govt. & Autonomous Engineering Institution by NIRF, MHRD, Govt. of India, 2016. Received 2<sup>nd</sup> prize for YCCE Magazine from RTMNU, Nagpur in 2019-20. Awarded 'A' Grade by the Government of Maharashtra in the year 2002-2003

All technical departments of the Institution are recognized as a center for Higher Learning and Research for pursuing Ph.D. by RTM Nagpur University. At Present about 82 scholars have registered for Ph. D. research programs and about 152 candidates have been awarded Doctoral (Ph.D) degree.

In last 5 Years, the institute has received financial assistance of Rs. 5.5 Cr. from various funding agencies like AICTE, DST, UGC etc. Innovation Gallery for displaying innovative UG/PG project work of students. MSME technology business incubators under ASPIRE (A scheme for promotion of innovation, rural industries and entrepreneurship) & business incubator under a scheme for development of managerial and entrepreneur skills through incubator. Nodal Centre for “Smart India Hackathon”, an initiative of MHRD Govt. of India.

Accreditation by repeated corporates/industries like TCS, Capgemini, Wipro etc. for enhancing student’s placement and internship.

### **1.2.1 Visionary**

Hon'ble Shri Dattaji Meghe is the architect of Nagar Yuwak Shikshan Santha, Nagpur. He has been the guiding star in spreading the light of education. His can-do-more attitude brought about an intellectual revolution that has transformed the social, educational, economic and cultural life of rural Maharashtra.

In pursuit of our Chairman's social commitment, a modest beginning was made by starting a small educational institute 36 years ago, which has grown up into a educational empire covering almost all faculties of education spread all over Maharashtra state.

This educational society has established 27 institutions right from pre-primary to postgraduate levels covering various faculties like Medical Sciences, Pharmacy, Engineering, Social Science, Commerce, Science, Physical Education and Performing Arts. The Society is like a joint family of about 30000 students and about 1500 highly educated and skilled staff. Our founder Chairman

Shri. Dattaji Meghe insists on good quality education, discipline and welfare of the students and the staff.

YCCE stands by its motto of becoming a leader in imparting quality education and training in engineering. It also contributes to the ever-expanding knowledge and skills in the professional environment through scientific inquiry, applied research and innovation to play a vital role in socio economic progress. The management and faculty are fully committed to generate excellence in academics and to attain the sacred goal of making the students realize their full potential in all dimensions of their personality.

### **1.2.2 Leadership**

Shri Sagar Meghe and Shri Sameer Meghe, who were empowered with knowledge and inspired by a tradition of accomplishment have with their focused expertise, far-reaching vision and strong commitment to humanity have given the new height to YCCE. This in turn is creating students, scholars and technocrats who in turn are contributing meaningfully to the service of mankind and the profession.

Under their great leadership, YCCE students learn not only to navigate and translate the engineering sciences in the classroom and laboratories but also to apply their developing knowledge and understanding in practical engineering applications in innovative ways.

### **Vision of the Institute**

To become the most preferred institution providing innovative, research and value based, professional education for the society at large.

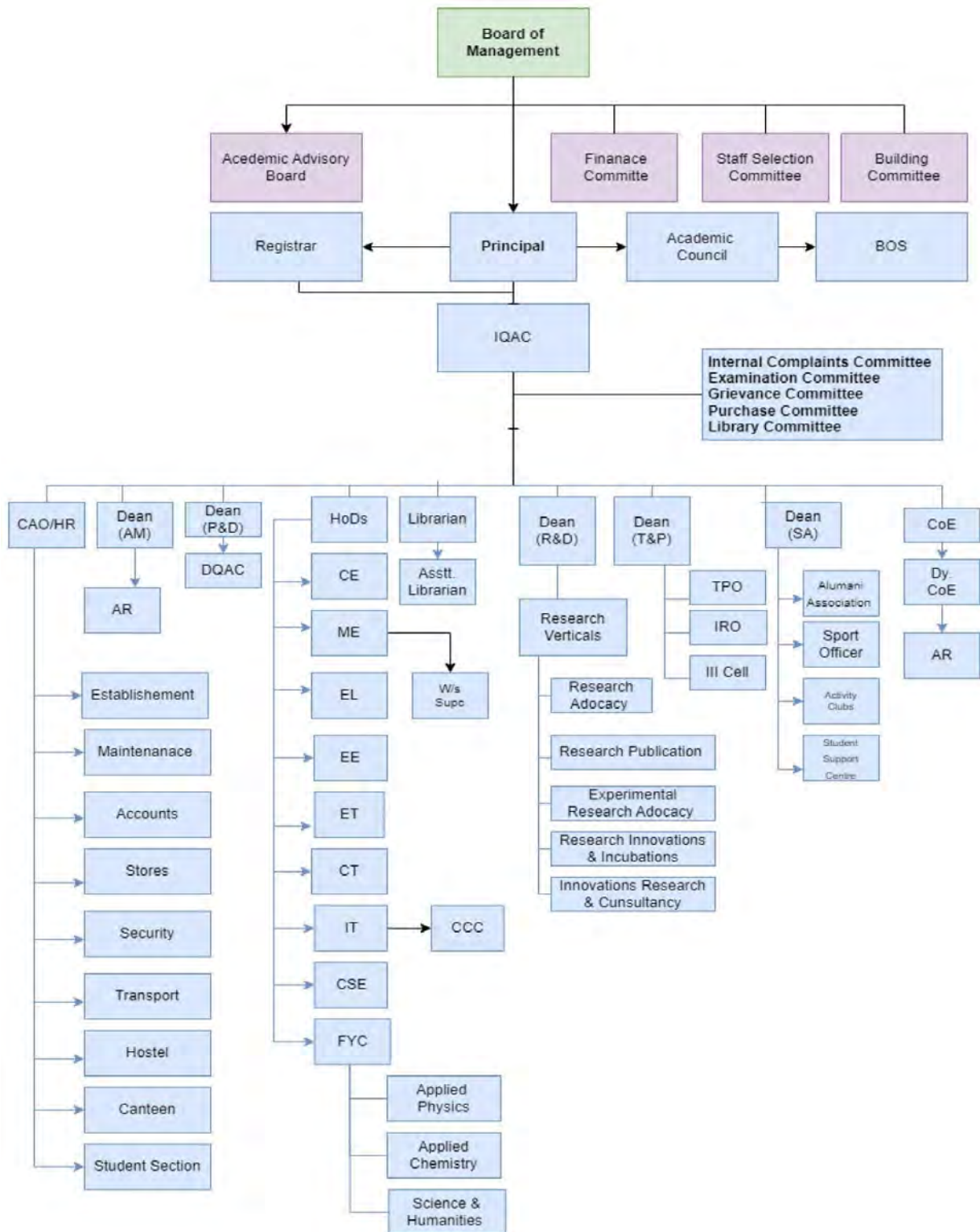
### **Mission of the Institute**

YCCE is committed to

- Attract best talent and create best learning ambience.
- Practice-innovative teaching-learning & research.
- Integrate Industry-Institute Collaborations.
- Nurture students towards holistic development and choicest careers.

1.2.3 Organization Structure of YCCE

Image No. 3: Organization Structure of YCCE



## **2.0 Green Audit**

### **2.1 Introduction**

Green audit was initiated with the beginning of 1970s with the motive of inspecting the work conducted within the organizations whose exercises can cause risk to the health of inhabitants and the environment. It exposes the authenticity of the proclamation made by multinational companies, armies and national governments with the concern of health issues as the consequences of environmental pollution. It is the duty of organizations to carry out the Green Audits of their ongoing processes for various reasons such as; to make sure whether they are performing in accordance with relevant rules and regulation, to improve the procedures and ability of materials, to analyze the potential duties and to determine a way which can lower the cost and add to the revenue. Through Green Audit, one gets a direction as how to improve the condition of environment and there are various factors that have determined the growth of carrying out Green Audit.

Green Audit is assigned to the Criteria 7<sup>th</sup> of National Assessment and Accreditation Council (NAAC) which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation.

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

### **2.2 Objectives of Green Audit:**

The main aim objective of this Environmental Audit is to assess the environmental quality and the management strategies being implemented and the conformation to the standards prescribed for management of environmental segments by Yeshwantrao Chavan College of Engineering, Nagpur.

- To assess the quality of the Water Component and Soil Component in the YCCE college campus.
- To track the Weather & Climate parameters around the campus and monitor Ambient Air Quality parameters of the YCCE college campus.

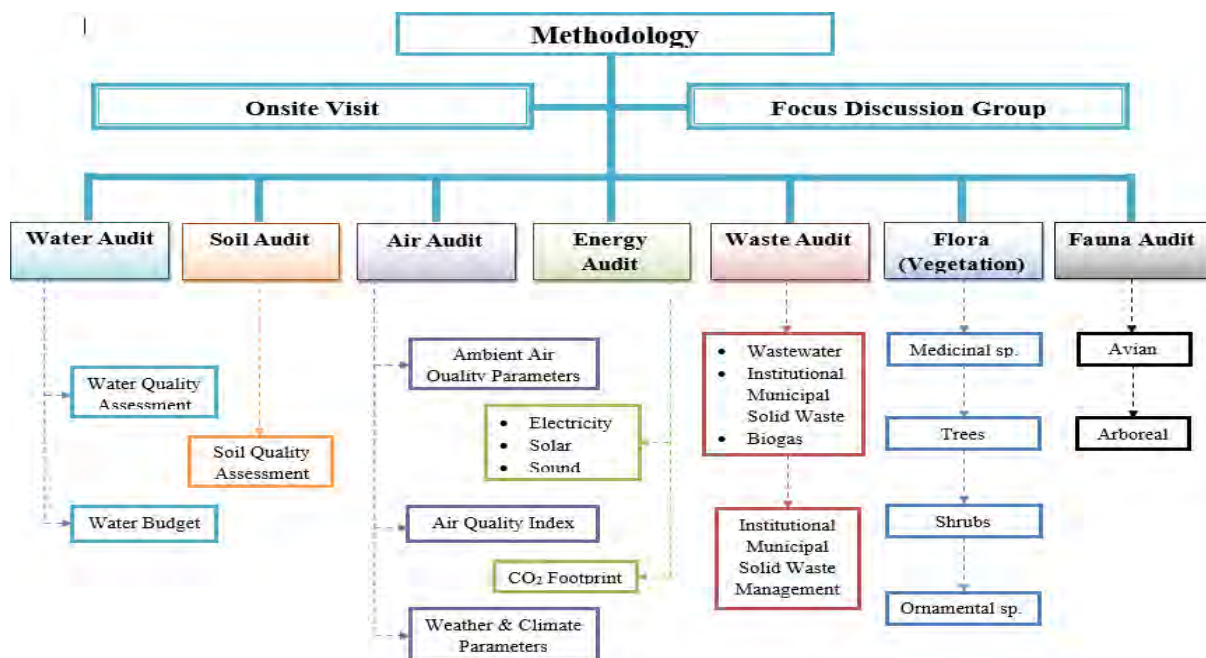
- To monitor the Energy Consumption pattern (Electricity & Solar Energy) of the YCCE college campus.
- To explore the flora and fauna species within the surrounding of YCCE college campus.
- To quantify the Solid Waste Generation and Management Plans in the YCCE college campus.
- To assess the Carbon footprint potential drawn Electricity and Solar Energy Consumption of the YCCE college campus.
- To evaluate the fire and safety equipment and facility existing at YCCE college campus.
- To assess whether extracurricular activities of the YCCE support the collection, recovery, reuse and recycling of solid wastes.
- To identify the gap areas and suggest recommendations to improve the Green Campus status of the Yeshwantrao Chavan College of Engineering, Nagpur.

### **2.3 Few key components under Green Audit**

- **Water Audit:** Evaluating the facilities of raw water intake and determining the facilities for water treatment. Water harvesting is one of the best techniques that can be adopted by simply storing the water and using it at the time of scarcity. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.
- **Waste Disposal Audit:** The waste clearance measures associated to hazardous wastes and recycling are reviewed. The auditor diagnoses the prevailing waste disposal policies and suggests the best way to combat the problems.
- **Energy Audit:** It deals with the energy conservation and methods to reduce its consumption and the related pollution. The auditor targets at the energy consuming methods adopted and find whether these methods are using the energy in a conservative way or not.
- **Environmental Quality Audit:** Analyzes the air quality, noise level and the programs undertaken by the institute for plantation. The Green Belt should be maintained to reduce the pollution level by decreasing the Carbon Dioxide Level.
- **Health Audit:** It analyzes the occupational diseases and safety measures undertaken within the institutes. Advocate the college initiative to encourage students to respect environment and conserve it through plantations. Excessive Plantations also helps in reducing the Carbon dioxide emission.

- Using Renewable Energy: Resources which can be replenished should be used such as rain, sunlight, wind tides etc. These resources are more advantageous as they cause least pollution. The importance of these resources is explained by the Audit team.
- Carbon accounting: It undertakes the measure of bulk of carbon dioxide equivalents exhaled by the organization through which the carbon accounting is done. It is necessary to know how much the organization is contributing towards the sustainable development. The auditor considers several efforts practiced by the institute to lower the Green House Gases in the atmosphere in order to make the campus more environmental friendly. But no technical Carbon Sequestration in basic audit report will cover due to restricted time & purpose of audit.

**Image No. 4: Methodology on Key Components of Green Audit**



## 2.4 Procedure for conducting Green Audit:

Green Audit was conducted systematically by using following procedure:

1. The members of green audit team visited the campus of the institute.
2. Green audit team members held an initial discussion with key staff members of the institute such as NAAC Criteria In-charge, maintenance manager as well as external service providers such as building architect, who have been assigned the responsibility of sustainable practices implemented throughout the campus.

3. Further, it was discussed and decided to follow Guidelines of NAAC Criteria for assessment of green initiatives.
4. Green audit team members created awareness among the staff members of the institute about importance of Green Audit and its contribution in improving the overall environmental performance of the institute.
5. Team members physically checked the presence of various green initiatives undertaken and facilities created through campus tour.
6. Then green audit team members identified the avenues for improvement in the existing green systems of the institute as well as continual improvement necessary for sustainable development of the institute.
7. Thereafter, green audit team discussed the technical and economic feasibility of implementation of new systems with institute's staff members and management.
8. A draft report of all these findings and suggestions was prepared and a presentation was given to management to identify any corrections/improvements.
9. The report was finalized after incorporating the suggestions by management/staff members as well as green audit team members and final report submitted to the institute.

### **2.5 Area Statements**

Yeshwantrao Chavan College of Engineering has a very good and systematic building infrastructure. All classrooms are fully ventilated and comfortable. Presently, it is one of the premier educational institutions of the country encompassing a vast, beautiful, and pollution-free campus which sprawls over 14 acres of land having vast playgrounds and experimental fields, botanical garden, well equipped Central Library, hostels for both girls and boys, Administrative Block, Spacious Auditorium, Computer Center, Health Center, Yoga Centre, Horticulture Section, Canteen and ATM. The teaching department belonging to different faculties, are housed in spacious buildings and have well-equipped laboratories and advanced facilities. The YCCE Campus is itself is a combination of all standards and amenities required as far as great educational infrastructure is concerned such as School, Health Centre, etc. The Central library has a large number of books to issue or read in the library itself. There is ample sitting space also available. Students can get Internet access at the library and power back up. YCCE has provided a Wi-Fi facility to all students and also has a book bank facility that enables students to use the books, for the entire academic session and the computer laboratories have access to advance web activity with its subscription to E-resources through a digital Network that links students and

researchers to the databases required for research. YCCE has facilities for both outdoor and indoor games.

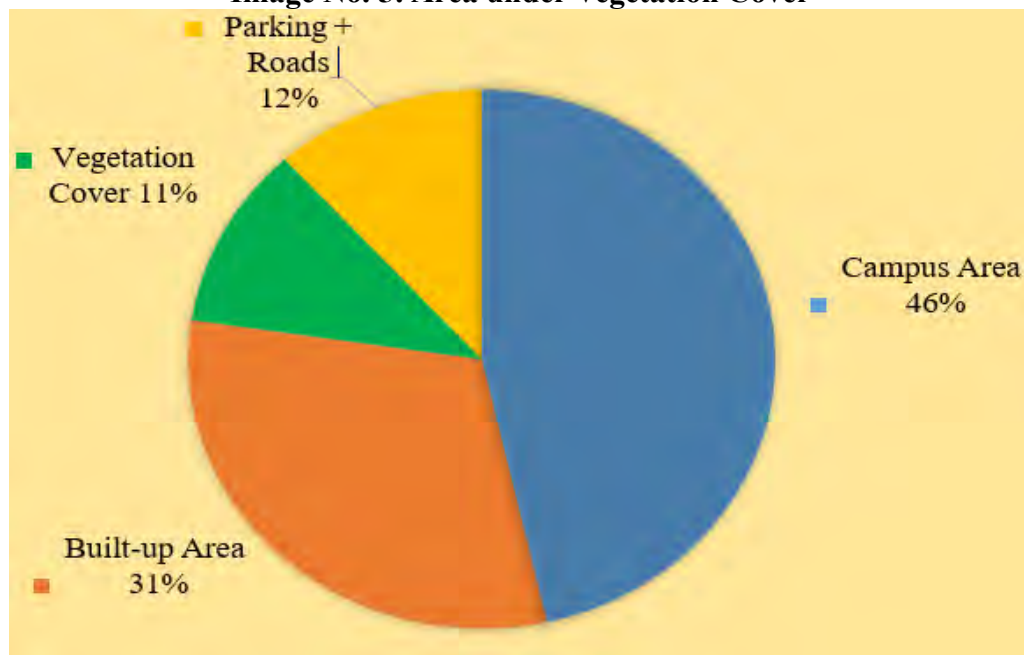
**Table No. 1: Area description of Study Region**

Sr. No.	Description	Details
1)	Campus Area	14 Acres
2)	Location	On a hill top, lush green environment with aesthetic environment, on Nagpur-Hingna Road
3)	Accessibility	15 Kms from Nagpur Railway Station and 14 Kms from Airport

**Table No. 2: Area segments-Total Built-up and Green Area at YCCE**

Sr. No.	Description	Area
1)	Campus Area	56,656 sq. m
2)	Built-up Area	37,702.76 sq. m
3)	Vegetation Cover	13,359 sq. m
4)	Parking + Roads	14,307 sq. m

**Image No. 5: Area under Vegetation Cover**





**Table No. 3: Department wise built-up Area at YCCE**

<b>Sr. No.</b>	<b>Name of Department Building</b>	<b>Floors</b>	<b>Built-up Area (Sq.m)</b>
1)	Administrative & Library Building	G+3	4146.054
2)	Civil Building	G+3	3619.668
3)	Civil Lab Shed	G.F.	513.86
4)	Electrical Building	G+3	5229.631
5)	Mechanical Building	G+3	3229.63
6)	Mechanical Lab Shed	G.F.	1253.736
7)	Workshop Shed	G.F.	1403.56
8)	Science Building	G+3	3410.754
9)	Electronics Building	L. G.F.+ G + 2	6818.75
10)	Central Computer Centre Building	G+1	1094.784
11)	IT Building	G+3	2977.811
12)	Canteen-I	G.F.	241.041
13)	Canteen - II	G.F.	298.084
14)	Exam Control Building	G+1	1250.412
15)	College Building (Block-T)	G+3	2214.985
<b>Total Built- up Area</b>			<b>37702.76</b>

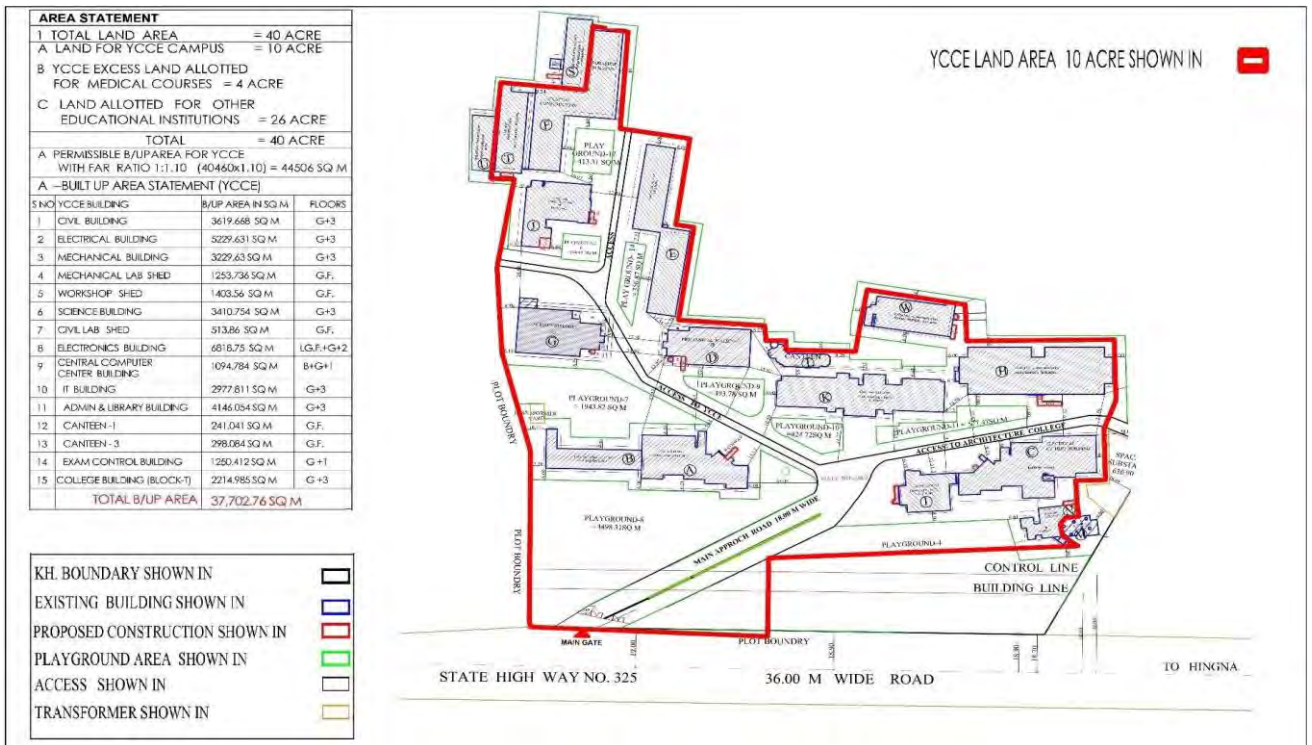
\* G - Ground Floor

G.F. - Ground Floor

**Table No. 4: Infrastructure of YCCE**

<b>Sr. No.</b>	<b>Description</b>	<b>Nos.</b>
1)	Total Classroom	97
2)	Total Tutorial rooms	
3)	Total Labs including Workshop	115
4)	Drawing Halls	3
5)	Smart Class Rooms	6
6)	Seminar Halls	4
7)	Computer Centre's	4
8)	Innovation Labs	3

**Image No. 6: Marked Boundary Area of YCCE campus**

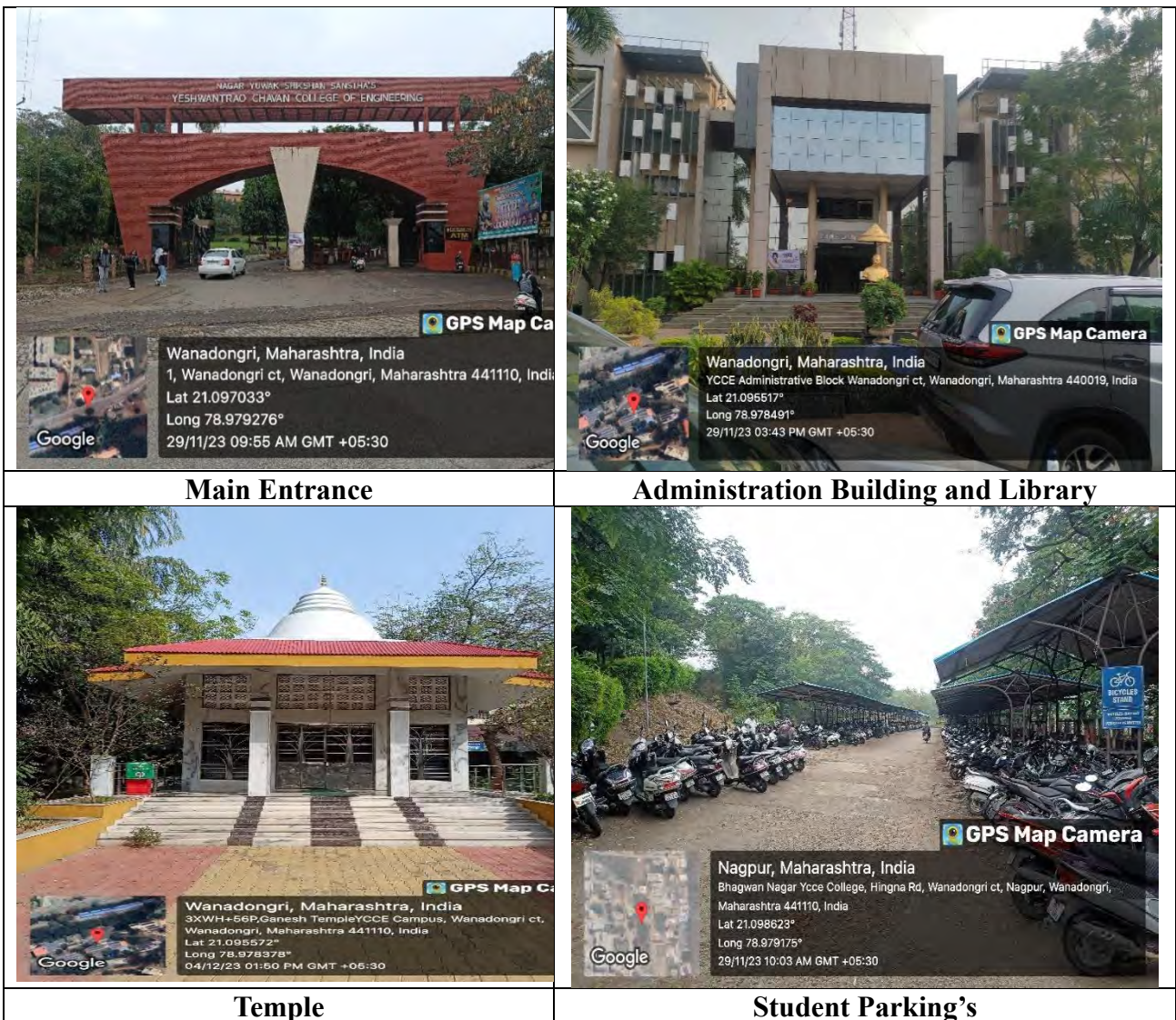


**Image No. 7: Satellite image of YCCE campus**



The YCCE campus has outdoor sports facilities which include a well maintained Cricket ground, football ground, and basketball court. Students also use this platform for their cultural competitions etc. A 1000 seats auditorium is available for seminars and conferences in the YCCE Campus. YCCE has a dedicated health center also tie up with renowned hospitals with all the necessary first aid facilities. The existing facilities are continuously upgrading and improving. Following are some photographs of major building infrastructures in YCCE campus.

**Image No. 8: Building infrastructures of YCCE campus**





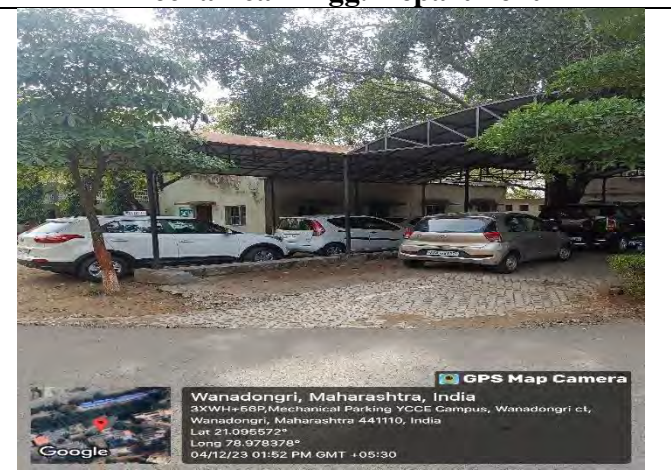
**Civil Engg. Department**



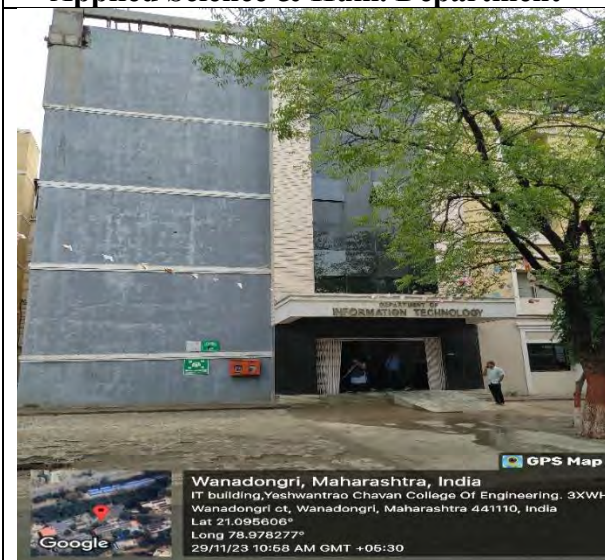
**Mechanical Engg. Department**



**Applied Science & Hum. Department**



**Staff Parking**



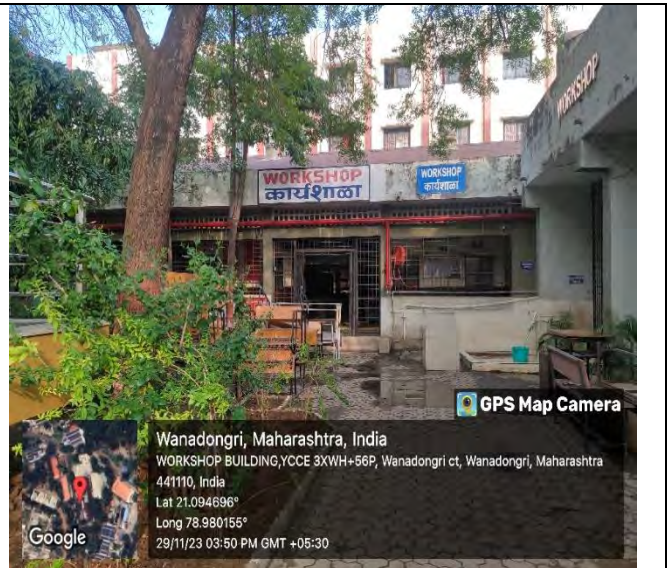
**Information Tech. Engg. Department**



**Old CCC & Computer Engg. Labs**



**New CCC Lab**



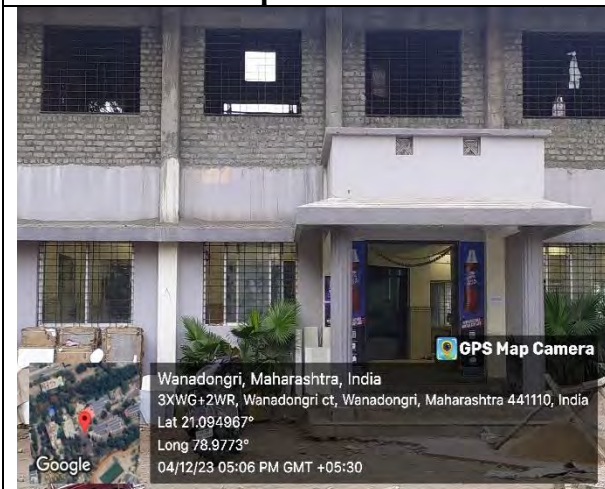
**Workshop**



**Computer Tech. & Electrical Engg. Department**



**Electronics and Telecommunication Engg. Department**



**Canteen**



**Auditorium**

### 3.0 Water Audit

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Although water is natural freely available but portable (drinkable) water is not available freely for human consumption. In our planet 70% area is covered by water but only 3% of it is fresh water. Around 1.1 billion people of the world face water crisis. Water pollution and wastage plays a vital role in water crisis. Water contaminations are taking place at an alarming rate. Drinking or using contaminated water leads to many diseases or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease. It is also important to conserve protect and manage the water resources availability and usage so that it is sustainably used. YCCE has examine the quality and usage of water in the college campus. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

The major Drinking water sources at YCCE are:

- 1) Maharashtra Jeevan Pradhikaran (MJP)
- 2) Maharashtra Industrial Development Corporation (MIDC)
- 3) Groundwater Well
- 4) Borewell-2 Nos.

The water sample was collected by purposive sampling method from common sump and subjected for the physico-chemical and biological characterization for qualitative and quantitative estimation of water within the campus.

**Image No. 9: Water sources within YCCE campus**

### 3.1 Indian Standards Specifications for Drinking Water

The Bureau of Indian Standards (BIS) has set several standards for drinking water quality in India. The standards may be updated, and it's advisable to check the latest documents from the Bureau of Indian Standards or other relevant authorities for the most recent information. Some key standards related to drinking water in India include:

IS 10500:2012 - Drinking Water Specification: This standard outlines the permissible limits for various physical, chemical, and microbiological parameters in drinking water. It covers aspects such as color, odor, taste, turbidity, pH, hardness, alkalinity, toxic elements, and microbiological contaminants.

IS 10501:2012 - Packaged Drinking Water (Other Than Natural Mineral Water) - Specification: This standard provides specifications for packaged drinking water, excluding natural mineral water. It covers the requirements for raw water, processing, and the finished product.

IS 13428:2005 - Packaged Natural Mineral Water - Specification: This standard outlines the specifications for natural mineral water and includes requirements for the source, composition, and labelling of packaged natural mineral water.

IS 14543:2004 - Packaged Drinking Water (Natural Mineral Water) - Specification: This standard covers the requirements for packaged drinking water produced from a source that may or may not be a natural mineral water source.

IS 16240:2015 - Drinking Water - Reverse Osmosis Systems for Household and Similar Use - Performance Requirements: This standard focuses on the performance requirements for reverse osmosis systems used for household and similar purposes to ensure the production of safe drinking water.

Following Table shows the permissible and acceptable limits of Drinking Water as per BIS.

**Table No. 5: Organoleptic and Physical Parameters**

Sr. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Remarks
i)	Colour, Hazen units, Max	5	15	Extended to 15 only, if toxic substances are not suspected in absence of alternate sources a) Test cold and when heated
ii)	Odour	Agreeable	Agreeable	—
iii)	pH value	6.5-8.5	No relaxation	b) Test at several dilutions
iv)	Taste	Agreeable	Agreeable	Test to be conducted only after safety has been established
v)	Turbidity, NTU, Max	1	5	—
vi)	Total dissolved solids, mg/l,	500	2,000	—

NOTE — It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under ‘acceptable’ render the water not suitable, but still may be tolerated in the absence of an alternative source but up to the limits indicated under ‘permissible limit in the absence of alternate source’ in col 4, above which the sources will have to be rejected.



**Table No. 6: General Parameters of Substances Undesirable in Excessive Amounts**

Sr. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Remarks
1)	Aluminium (as Al), mg/l, Max	0.03	0.2	—
2)	Ammonia (as total ammonia-N), mg/l, Max	0.5	No relaxation	—
3)	Anionic detergents (as MBAS) mg/l, Max	0.2	1.0	—
4)	Barium (as Ba), mg/l, Max	0.7	No relaxation	—
5)	Boron (as B), mg/l, Max	0.5	1.0	—
6)	Calcium (as Ca), mg/l, Max	75	200	—
7)	Chloramines (as Cl <sub>2</sub> ), mg/l, Max	4.0	No relaxation	—
8)	Chloride (as Cl), mg/l, Max	250	1,000	—
9)	Copper (as Cu), mg/l, Max	0.05	1.5	—
10)	Fluoride (as F) mg/l, Max	1.0	1.5	—
11)	Free residual chlorine, mg/l, Min	0.2	1	It should be minimum 0.5 mg/l.
12)	Iron (as Fe), mg/l, Max	0.3	No relaxation	Shall not exceed 0.3 mg/l
13)	Magnesium (as Mg), mg/l, Max	30	100	—
14)	Manganese (as Mn), mg/l, Max	0.1	0.3	Shall not exceed 0.3 mg/l
15)	Mineral oil, mg/l, Max	0.5	No relaxation	—
16)	Nitrate (as NO <sub>3</sub> ), mg/l, Max	45	No relaxation	—
17)	Phenolic compounds (as C <sub>6</sub> H <sub>5</sub> OH), mg/l, Max	0.001	0.002	—
18)	Selenium (as Se), mg/l, Max	0.01	No relaxation	—
19)	Silver (as Ag), mg/l, Max	0.1	No relaxation	—
20)	Sulphate (as SO <sub>4</sub> ) mg/l, Max	200	400	—
21)	Sulphide (as H <sub>2</sub> S), mg/l, Max	0.05	No relaxation	—
22)	Total alkalinity as calcium carbonate, mg/l, Max	200	600	—
23)	Total hardness (as CaCO <sub>3</sub> ), mg/l, Max	200	600	—
24)	Zinc (as Zn), mg/l, Max	5	15	—
Notes:				
1) In case of dispute, the method indicated by '*' shall be the referee method.				
2) It is recommended that the acceptable limit is to be implemented. Values in excess of those mentioned under 'acceptable' render the water not suitable, but still may be tolerated in the absence of an				

alternative source but up to the limits indicated under 'permissible limit in the absence of alternate source' in col 4, above which the sources will have to be rejected.

**Table No. 7: Parameters Concerning Toxic Substances**

Sr. No.	Characteristic	Requirement (Acceptable Limit)	Permissible Limit in the Absence of Alternate Source	Remarks
i)	Cadmium (as Cd), mg/l, <i>Max</i>	0.003	No relaxation	—
ii)	Cyanide (as CN), mg/l, <i>Max</i>	0.05	No relaxation	—
iii)	Lead (as Pb), mg/l, <i>Max</i>	0.01	No relaxation	—
iv)	Mercury (as Hg), mg/l, <i>Max</i>	0.001	No relaxation	—
v)	Molybdenum (as Mo), mg/l, <i>Max</i>	0.07	No relaxation	—
vi)	Nickel (as Ni), mg/l, <i>Max</i>	0.02	No relaxation	—
vii)	Pesticides, µg/l, <i>Max</i>	—	No relaxation	—
viii)	Polychlorinated biphenyls, mg/l, <i>Max</i>	0.000 5	No relaxation	or APHA 6630
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, <i>Max</i>	0.000 1	No relaxation	—
x)	Total arsenic (as As), mg/l, <i>Max</i>	0.01	0.05	—
xi)	Total chromium (as Cr), mg/l, <i>Max</i>	0.05	No relaxation	—

**Table No. 8 : Bacteriological Quality of Drinking Water**

Sr. No.	Organisms	Requirements
1)	All water intended for drinking: E. coli or thermo-tolerant coliform bacteria	Shall not be detectable in any 100 ml sample
2)	Treated water entering the distribution system: E. coli or thermo-tolerant coliform bacteria Total coliform bacteria	Shall not be detectable in any 100 ml sample
3)	Treated water in the distribution system: E. coli or thermo-tolerant coliform bacteria Total coliform bacteria	Shall not be detectable in any 100 ml sample

**Table No. 9: Qualitative & Quantitative Parameters of Drinking Water Source at YCCE campus**

<b>Sr. No</b>	<b>Characteristics Parameters</b>	<b>Values</b>
1)	Odor	Odorless
2)	Color	<1 Hazen
3)	Taste	Agreeable
4)	pH	7.2
5)	Electrical Conductivity mS/cm	0.59
6)	Water Temperature	22
7)	Turbidity (NTU)	0.24
8)	Total Solids (mg/L)	234
9)	Dissolve Solids (mg/L)	257
10)	Suspended solids (mg/L)	<3
11)	Relative Density	1
12)	Dissolve Oxygen (mg/L)	6.2
13)	Alkalinity (as CaCO <sub>3</sub> , mg/L)	195
14)	Total Hardness (as CaCO <sub>3</sub> , mg/L)	164
15)	Carbonate	Absent
16)	Bicarbonate (HCO <sub>3</sub> )	8.2
17)	Sodium (meq/L)	3.58
18)	Calcium (meq/L)	2.2
19)	Magnesium (meq/L)	4.63
20)	Potassium (meq/L)	0.03
21)	Chloride (meq/L)	61
22)	Sulphate (mg/L)	4
23)	Ortho Phosphate (mg/L)	<0.04
24)	Fluorides (mg/L)	0.325
25)	Iron (mg/L)	0.139
26)	Nitrates (mg/L)	2.671
27)	Aluminum (mg/L)	<0.028
28)	Copper (mg/L)	0.025
29)	Zinc (mg/L)	0.0267
30)	Sodium Absorption Ratio (SAR)	1.3
31)	Residual Sodium Carbonate (RSC)	Absent
32)	Fecal coliform (CFU)	Absent
33)	E. Coli (CFU)	Absent

## Image No. 10: Sample Report of Water Testing



Hajar Yashwantrao Chavan Sanstha's  
**Yeshwantrao Chavan College of Engineering**  
 (An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur-441110

NAAC Accredited with 'A' Grade

Ph. : 07104-295083, 295085

Website : www.ycce.edu., Email : principal@ycce.edu.

**Our Vision**

To become most sought after destination for learning and research in civil engineering.

**Our Mission**

To prepare Civil Engineering professionals by practicing analytical, design tools, Field learning and live industrial projects in conducive environment.

**DEPARTMENT OF CIVIL ENGINEERING**

Date :- 06<sup>th</sup> March 2023

To,  
 The HOD,  
**Old Science Department,**  
 Wanadongri Campus, Hingna road, Nagpur.

**Subject:** Test results of water sample of Old Science Department, YCCE Nagpur.

Respected Sir,

Following are results for the water sample send by you,

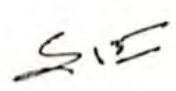
Sr. No.	Parameter	Permissible limit by IS10500	Results
1.	Physical appearance	Unobjectionable	Colorless
2.	Odor	Unobjectionable	Odorless
3.	Turbidity	5NTU	0NTU
4.	pH	6.5- 8.5	6.5
5.	Total Hardness	200mg/l	68mg/l
6.	Chloride	250mg/l	12.5mg/l
7.	Total Dissolved Solids	500mg/l	40mg/l
10.	Dissolved Oxygen	8mg/l	6.4mg/l
11.	Total alkalinity	600mg/l	30mg/l
12.	Nitrate	45mg/l	0
13.	Sulphate	200mg/l	0.63mg/l
14.	Bacterial Test (MPN)	0/100ml	Negative

**Remark :**

- All above Parameters have been found out as per Standard methods and relevant IS codes.
- The bacterial quality of water is found to be safe.
- Water is **POTABLE**

Thanking You,

  
 Dr. S.V. Ambekar  
 Ho. WOODS LAB

  
 Dr. S.P. Raut  
 Head

**Table No. 10: Water Source at YCCE: I] Maharashtra Industrial Development Corporation (MIDC)**

Sr. No.	Month	Year	Meter Readings	Total water quantity (Cu.m)	Total Amount
1)	April	2022	2873	1320	11881
2)	May	2022	16915	14042	106391
3)	June	2022	22346	5431	48879
4)	July	2022	29681	7335	66015
5)	August	2022	38831	3838	37785
6)	September	2022	45834	7003	67072
7)	October	2022	45834	7003	67072
8)	November	2022	58908	13074	121953
9)	December	2022	63992	5084	48501
10)	January	2023	74991	10999	122086
11)	February	2023	85502	10511	120492
12)	March	2023	89333	3831	23425
13)	April	2023	91076	1743	16123

**Table No. 11: Water Source at YCCE: II] Maharashtra Jeevan Pradhikaran (MJP)**

Sr. No.	Month	Year	Amount charged/1000 litres	Total water quantity (litres)	Total Units Used	Total Amount
1)	April-May	2022	250	2910000	291	72750
2)	June-July	2022	250	2910000	291	72250
x`3)	August-September	2022	250	2910000	291	72250
4)	October- January	2023	250	2470000	247	61750
5)	February-March	2023	250	1800000	188	47000

\* 1 Unit-10000 Lit. of water

Table No. 12: Availability of Drinking Water Systems

Sr. No	Location	Capacity of RO	Centralized / Domestic	Centralized RO working mode	Flow of water centralized RO	TDS of Inflow Water	TDS of outflow water
1)	Maintenance Dept.	50	Domestic			675	101
2)	Admin Building	50	Domestic			650	102
3)	New Electronics (EE)	500	Centralized	Manual	475	650	94
4)	New Ele & Tel. (ETC)	500	Domestic	Manual	480	650	108
5)	CCC (Conf.)	50	Centralized			650	85
6)	Electrical Engg.	500	Domestic	Manual	450	625	78
7)	Civil Engg.	500	Centralized	Manual	500	625	97
8)	Old Sci. Dept.	500	Centralized	Manual	500	625	107
9)	Mechanical Engg. Lab	UV kent	Domestic			625	625
10)	IT Building	500	Domestic	Manual	450	625	87
11)	Mechanical Engg.	500	Domestic	Manual	500	625	105
12)	Workshop	UV kent +R.O 20 Lph	Domestic			625	198
13)	CCC Building	UV kent	Domestic			625	625
14)	COE Office	UV kent	Domestic			625	625
15)	Canteen Vihan	UV kent	Domestic			625	625
16)	Canteen Swaragi	UV kent	Domestic			625	625
17)	Old Sci.(CHE)	20	Domestic			625	15

**Table No. 13: Department-wise Water Tank Provision**

<b>Sr. No.</b>	<b>Department</b>	<b>Type of tank</b>	<b>Capacity in .Ltrs</b>	<b>Quantity</b>
1)	Mechanical Engineering Building	Syntex Tank	5000	2
		Syntex Tank	3000	1
2)	Civil Engineering Building	Overhead RCC Tank	14256	1
		Syntex Tank	3000	1
3)	Old Science Building	Overhead RCC Tank	25920	1
		Syntex Tank	3000	1
4)	Swaragi Canteen	Syntex Tank	5000	1
5)	B. P. Ed. Hall (auditorium)	Underground Sump	150000	1
6)	Workshop Building	Underground Sump (Panchkon)	64800	1
		Underground Sump	1728	1
		Syntex Tank	3000	1
7)	CCC Building (computer department)	Overhead RCC Tank	8640	1
		Syntex Tank	2000	1
8)	Old Electrical Building	Underground Sump	27540	1
		Overhead RCC Tank	27540	1
		Syntex Tank	3000	1
9)	New Electronics Building	Overhead RCC Tank	18144	1
		Overhead RCC Tank	7560	1
		Overhead RCC Tank	5000	1
10)	Admin Building	Overhead RCC Tank	8640	2
11)	Tiled Sump in front of admin building	Underground Sump (Fountain)	26412	1
		Overhead RCC Tank	7290	2
12)	Maintenance Building	Underground Sump	100000	1
13)	STP filter Plant	Underground Sump	8282	1
14)	Fluid Power lab Building	Underground Sump	30184	1
15)	SOS Gate	Underground Sump	30184	1
16)	Mahada Colony pump house	Underground Sump	129600	1
17)	COE Building	Syntex Tank	3000	2
18)	IT Building	Overhead RCC Tank	20000	1
<b>Total</b>			<b>7,41,720</b>	

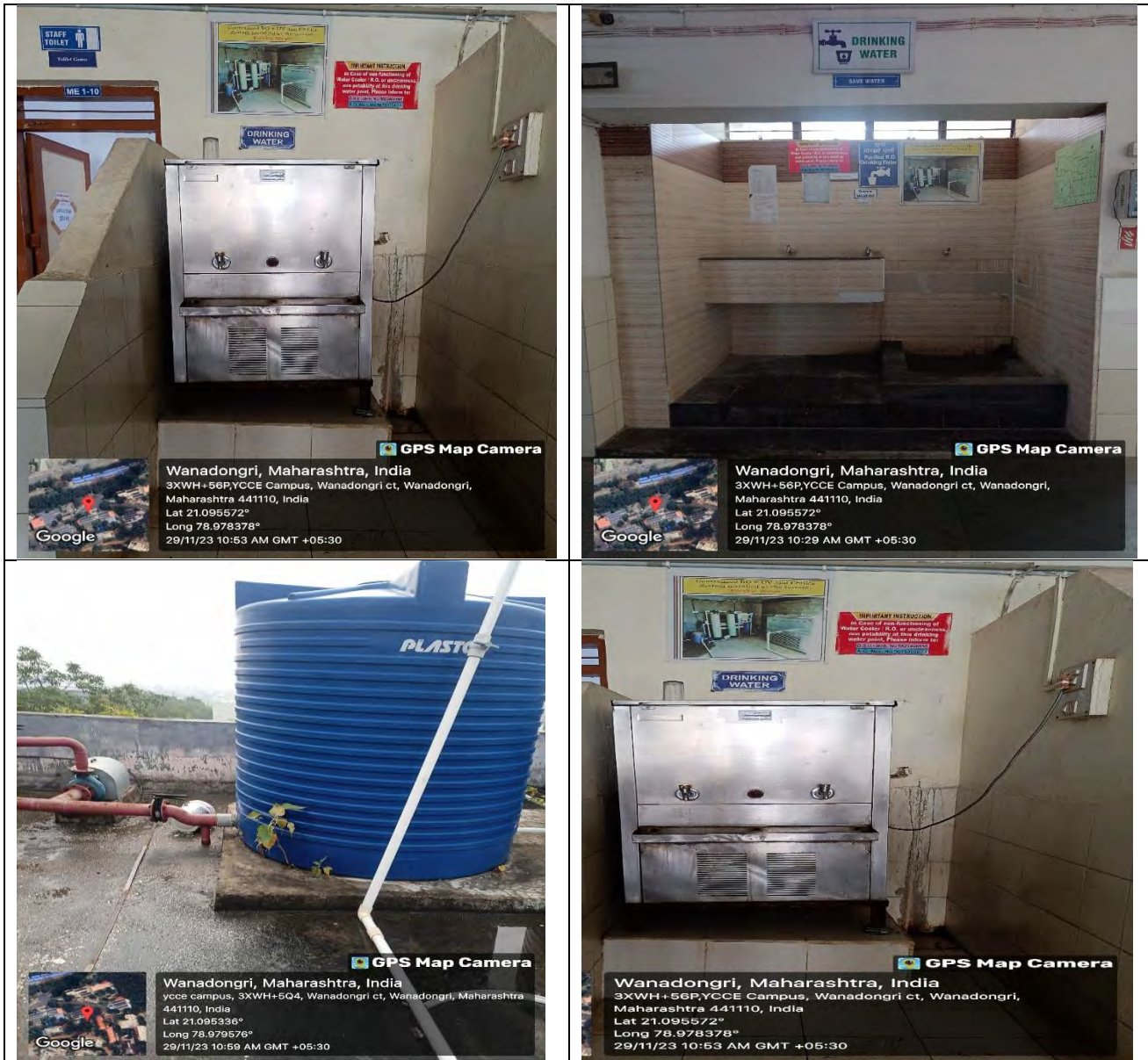
Table No. 14: Water Dispensing Connectivity

Sr. No.	Department	Tap		Water Coolers	
		Regular water	Drinking water		
1)	CSE Building	Ground Floor	3	0	1
		1 <sup>st</sup> Floor	5	0	1
		2 <sup>nd</sup> Floor	5	0	1
		3 <sup>rd</sup> Floor	0	0	1
2)	IT Building	Ground Floor	7	0	0
		1 <sup>st</sup> Floor	7	0	1
		2 <sup>nd</sup> Floor	7	2	1
		3 <sup>rd</sup> Floor	7	0	1
3)	Old Science Building	Ground Floor	40	0	1
		1 <sup>st</sup> Floor	11	0	1
		2 <sup>nd</sup> Floor	4	0	1
		3 <sup>rd</sup> Floor	6	0	0
4)	Civil Building	Ground Floor	14	2	1
		1 <sup>st</sup> Floor	9	2	0
		2 <sup>nd</sup> Floor	3	2	1
		3 <sup>rd</sup> Floor	6	2	0
5)	Mechanical Building	Ground Floor	4	2	0
		1 <sup>st</sup> Floor	4	0	1
		2 <sup>nd</sup> Floor	4	2	1
		3 <sup>rd</sup> Floor	5	2	0
6)	Administration Building	Ground Floor	13	0	1
		1 <sup>st</sup> Floor	5	2	0
		2 <sup>nd</sup> Floor	5	0	1
		3 <sup>rd</sup> Floor	6	0	0
7)	COE Building	Ground Floor	11	0	0
		1 <sup>st</sup> Floor	11	2	1
8)	Electronics Building	Ground Floor	23	9	0
		1 <sup>st</sup> Floor	18	0	2
		2 <sup>nd</sup> Floor	18	0	2
9)	Electrical Building	Ground Floor	6	2	1
		1 <sup>st</sup> Floor	8	3	0
		2 <sup>nd</sup> Floor	4	4	0
		3 <sup>rd</sup> Floor	4	3	0
10)	CCC Building	Ground Floor	7	0	1
		1 <sup>st</sup> Floor	5	0	1
11)	Workshop 1	Ground Floor	9	0	1
12)	Workshop 2	Ground Floor	8	0	1
13)	Swaragi Canteen	Ground Floor	2	0	1
<b>Total</b>			<b>314</b>	<b>41</b>	<b>29</b>



Following are the several pictures of Water Dispensing units in YCCE Campus

**Image No. 11: Water Dispensing units in YCCE Campus**



The Institute stores the water in overhead tank as well as underground sump above mentioned building in Table No.- 13 having storage capacity of 7.4 Lakh liters approximately. The organization does not have any automatic leak detection system and all the leakages are controlled by manual observation hence leak quantum water is another issue which shall be considered in designing the water conservation scheme. No leakage of water from pipes is observed from pipes by auditor team

but leakages in taps were observed in some urinals. There are almost 1200 taps in the college premises from which the water is used for different use. There is tap maintenance schedule with the maintenance department; the leakage problem will be solved by them only when they get any compliant.

### **3.2 Sewage Effluent Generation**

The source waste water is categorized in two types (i) Laboratory Waste Water which can be said as Effluent and (ii) Domestic Waste Water i.e. Sewage Water. The effluent produced in this institute is about 5000 liters per week per laboratory and there are two such laboratories producing effluent is first year Chemistry Laboratory and the Environment Laboratory in Civil Engineering department. The effluent produced is released to the common drainage without any treatment which is damaging to the environment and have very big concerned with ground water contamination. The Sewage water mainly comes from Toilets in college, hostel, kitchen and canteen. The generated sewage is transferred to sewage treatment plant.

### **3.3 Rainwater Harvesting Potential at YCCE**

The campus is situated at the western part of Nagpur city. The campus area is located at the Hingna Road which is surrounded by the residential as well as industrial areas. Total strength of campus including students and staffs people will be more than 6,000. The campus is fulfilling their domestic water requirement from Borewell, well and water procured from MJP & MIDC. A open well is situated in campus which can be serve as a source for additional water requirement. Water requirement in campus increases gradually due to heavy crowd students as well as staff. Now on days, water scarcity has become the most common problem in every parts of India. And, this problem is also being profoundly seen inside the YCCE campus. And, if it has not been dealt earlier with proper care then this problem will become a major hurdle in the development phase of campus. The average monthly rainfall data are being taken from the website Regional Meteorological Centre of India Meteorological department, Mumbai. Thus monthly rainfall data of the Nagpur city is given below in the table no.1 which is assumed to be same for the station of YCCE campus.

**Table No.15: Monthly Rainfall Data of Nagpur City**

Sr. No.	Month	Rainfall (mm)
1	January	12.5
2	February	20.7
3	March	17.6
4	April	14.3
5	May	19.2
6	June	190.1
7	July	341.7
8	August	280.5
9	September	183.1
10	October	56.8
11	November	16.6
12	December	13.2
<b>Total</b>		<b>1166.3</b>

(Source:-<https://www.weather-ind.com/en/india/nagpur-climate#rainfall>)

**Table No. 16: Calculation of Rooftop Area of All Building in YCCE Campus**

Sr. No.	Building Name	Roof top Area (m <sup>2</sup> )
1	Civil Engg. Building	886.304
2	Civil Engg. Shed	513.86
3	Science Building old	796.935
4	Mechanical Workshop	1403.56
5	Mech. Lab & New CCC	1253.736
6	New Science & IT Building	743.70
7	Architect College (Old Mahatma Gandhi)	763.03
8	Architect College (Main Building)	744.048
9	Swaragi Canteen	453.248
10	New Girls Hostel	511.107
<b>Total</b>		<b>8070.00</b>

### Computation of Volume of Runoff per Year

As we know the formula for runoff discharge is

Total roof area of Wanadongari campus is = 8070.00 m<sup>2</sup>

Average annual rainfall at Nagpur=1166 mm/year = 1.16m<sup>3</sup>/year Total volume of surface runoff

water supposed to be collected=8070.00 x 1.1663 = 9412.05 m<sup>3</sup>/year

**Table No. 17: Annual Rooftop Rainwater Harvesting Potential at YCCE**

Sr. No.	Month	Rainfall (mm)	Discharge (m <sup>3</sup> )/Year
1	January	12.5	100.875
2	February	20.7	167.049
3	March	17.6	142.032
4	April	14.3	115.401
5	May	19.2	154.944
6	June	190.1	1534.107
7	July	341.7	2757.519
8	August	280.5	2263.635
9	September	183.1	1477.617
10	October	56.8	458.376
11	November	16.6	133.962
12	December	13.2	106.524
<b>Total</b>		<b>1166.3</b>	<b>9412.05</b>

**Table No. 18: Annual Water Budget of YCCE**

Sr. No.	YCCE Water Source	Total Volume of Water	Purpose of Water Use			Wastewater Generated at STP	Treated Water & Disposed
			Domestic	Laboratory	Sanitation		
1	MJP	13080 Cu.m	Drinking, Irrigating Lawns	Distillation, Washing Glassware, Others	Flushing, Washing, Cleaning Toilets, etc	83435.2 Cu.m	83435.2 Cu.m
2	MIDC	91214 Cu.m	Drinking, Irrigating Lawns	Distillation, Washing Glassware, Others	Flushing, Washing, Cleaning Toilets, etc		

### **Observation & Recommendations**

- 1) Institute authority should have any water management or water conservation plan.
- 2) At present waste water is recycled after treatment and reused in any form in the college premises
- 3) Drip irrigation and sprinklers should be preferred for watering the garden.
- 5) The rain water is drained by storm water drain and released to RWH well inside the campus

### **Recommendations**

- 1) Establish and implement the Water Conservation and Management Plan as per Environment Protection Act 1986
- 2) The water Conservation Awareness Program to be conducted on World Water Day on 22<sup>nd</sup> March every year
- 3) Green Chemistry Methodology in laboratories to be considered viz. solvent extraction from Chemistry and Environment Laboratories of the college
- 4) Display boards for switching off the taps to be put on at appropriate place
- 5) To eliminate the spillage and over usage of water in washbasins, urinals and toiler push taps are highly recommended.
- 6) Automatic Leak detection systems for conservation of water.
- 7) Rain Water Harvesting as per the guidelines of Central Ground Water Board shall be done for rest of buildings.
- 8) 80 % of total quantum of ground water extracted shall be recharged to ground either by Artificial Recharge Structures within the college premises
- 9) Water discharge should be measure with water meters to be installed on Dug Well as well as Bore Well as per the guideline of CGWA
- 10) Special Internal Water Audit to be conducted yearly
- 11) Advance treatment systems should be upgrade in existing STP, so that reuse of treated water for flushing in toilets and also gardening purpose.

## 4.0 Air Audit

In addition to land and water, air is the prime resource for sustenance of life. In recent years, medium and small towns and cities have also witnessed an increase in pollution, thus getting fast reflected in the non-attainment cities of India. Air pollution has increasingly become a serious concern, predominantly because of its health impacts. Thus, regular track of Air Quality is important for human health. One way to describe air quality is to report the concentrations of all pollutants with acceptable levels. An air quality index is defined as an overall scheme that transforms the weighed values of individual air pollution related parameters (for example, pollutant concentrations) into a single number or set of numbers. The air sampling was done by purposive random sampling method at different locations within the campus to compute the qualitative and quantitative air pollutant data. The Air pollution index is generated with this data for the college campus.

It was observed and revealed from data that the only possible sources of pollution in the YCCE campus are as use of diesel / petrol vehicles, air-conditioners, power generator, kitchen waste and other biodegradable waste from canteen, use of electronic appliances and other.

Following Table No. 19 shows the data of Vehicle entered in the YCCE campus

**Table No. 19: Vehicle data (Department wise)**

SR. No.	Department	Four Wheeler	Two Wheeler
1	Civil Engineering	22	16
2	Mechanical Engineering	24	12
3	Computer Science Engineering	4	12
4	Computer Technology	19	15
5	Electrical Engineering	25	20
6	Electronics Engineering	15	16
7	Electronics and Telecommunication Engineering	18	6
8	Information Technology	9	23
9	Mathematics	6	15
10	Applied Physics	3	7
11	Applied Chemistry	2	9
12	Administrative Office + A/C	6	18
13	DAM	2	1
14	COE Office	3	7
15	Library	2	8
16	Maintenance	1	3
17	Store	0	1
<b>Total</b>		<b>161</b>	<b>189</b>

Every day there are 189 Two wheelers and 161 four wheelers of different staff and almost 500 to 600 two wheelers of students are coming in college premises but there is no system observed to check for PUC certificate, Vehicle Exhaust Gas Analysis and Vehicular movement noise and vibration pollution. The air pollution at the time of ignition off and on is more than it is in riding mode.

**Image No. 12: Sampling Locations of Air Component**



**Table No. 20: National Ambient Air Quality Standards**

Sr. No.	Pollutants	Time weighted Average	Concentration of Ambient Air	
			Industrial, Residential, Rural Areas	Ecologically Sensitive Area
1)	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	Annual	50	20
		24 hrs	80	80
2)	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	Annual	40	30
		24 hrs	80	80
3)	Particulate matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	Annual	60	60
		24 hrs	100	100
4)	Particulate matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	Annual	40	40
		24 hrs	60	60
5)	Ozone (O <sub>3</sub> ), µg/m <sup>3</sup>	8 hours	100	100
		1 hours	180	180
6)	Carbon monoxide (CO) mg/m <sup>3</sup>	8 hours	02	02
		1 hours	04	04

Source: National Ambient Air Quality Standards, CPCB, New Delhi, 18th November, 2009



**Table No. 21: Qualitative and Quantitative Characteristics of Air at different locations at YCCE**

Sr. No.	Months	Locations	CO	NO <sub>2</sub>	SO <sub>2</sub>	RSPM	SPM	O <sub>3</sub>	NH <sub>3</sub>
1)	April	L1	1798	22.33	9.1	72.11	175.6	122	21
2)	May	L2	532	14.22	8.1	32.44	172	112	22
3)	July	L3	1798	24.57	11.14	83.28	303.14	49	21
4)	August	L4	538	18	8.7	101	344.33	89	22
5)	September	L5	502	28.88	11.88	124.33	365.66	132	22
6)	October	L6	510	28.9	9.72	105	234.09	110	23
7)	November	L7	508	34.26	9	165.26	308.73	129	21
8)	December	L8	502	25.44	6.4	114.55	255	112	21
9)	January	L9	503	19.11	6.1	87.22	57.11	30	21
10)	February	L10	502	18.42	5.8	94.14	209	39	21
11)	March	L11	503	15.44	5.3	96.44	184.4	121	22

\*CO- Carbon monoxide

NO<sub>2</sub>- Nitrogen dioxide

SO<sub>2</sub>- Sulphur dioxide

RSPM - Respirable Suspended Particulate matter

SPM - Suspended Particulate matter

O<sub>3</sub>- Ozone

NH<sub>3</sub>- Ammonia

**Table No. 22: Assessment of Air Quality Index (AQI) of YCCE**

Sr. No.	Months	Locations	AQI
1)	April	L1	71.3
2)	May	L2	33.66
3)	July	L3	81.28
4)	August	L4	99
5)	September	L5	114.88
6)	October	L6	100.36
7)	November	L7	143.53
8)	December	L8	109
9)	January	L9	87
10)	February	L10	92.57
11)	March	L11	95.33

### **Observation & Recommendations**

- 1) World Environment Day to be celebrated in college premises every year on 5th June and whole college students and staff shall get involved and take Oath for Environment Conservation not only in college but also in every span of life.
- 2) Environment Division of Civil Engineering Department shall monitor the Ambient Air Quality as per the guidelines of “Air (Prevention and Control of Pollution) Act 1981, Water Quality as per IS 10500, Waste water from Laboratory and STP as per EPA 1986 in their Environment Laboratory
- 3) Exhaust gases shall be monitored, analyzed and check regularly
- 4) Parking zone of college shall be neat & clean.
- 5) Use of bicycle in campus to be promoted.

## 5.0 Weather & Climate Audit

Weather is the mix of events that happen each day in our atmosphere. Even though there's only one atmosphere on Earth, the weather isn't the same all around the world. Weather is different in different parts of the world and changes over minutes, hours, days, and weeks. Most weather happens in the part of Earth's atmosphere that is closest to the ground—called the troposphere. Whereas weather refers to short-term changes in the atmosphere, climate describes what the weather is like over a long period of time in a specific area. Different regions can have different climates.

Weather is made up of multiple parameters, including air temperature, atmospheric (barometric) pressure, humidity, precipitation, solar radiation and wind. Each of these factors can be measured to define typical weather patterns and to determine the quality of local atmospheric conditions. The environmental conditions produced by different weather parameters have an impact on the quality of the surrounding ecosystem. Weather elements form a chain reaction, as the impacts do not remain solely in the atmosphere. Temperature, pressure and humidity (moisture) can interact to form clouds. These clouds, in turn can reduce solar radiation for plants, or increase precipitation, which can runoff into a body of water. Consistently high temperatures can increase the heat transfer to local bodies of water in addition to heating the air. Likewise, a lack of precipitation affects not only weather conditions, but soil moisture and water levels due to evaporation. Wind speed and direction can be indicative of a front moving into the area, or it can create waves and encourage a stratified water column to mix.

Weather monitoring can establish a database of typical conditions. When one or more weather elements deviate from this standard, the information can be used to explain or predict weather events. Monitoring weather conditions is important not only as an environmental baseline, but to maintain quality working conditions, marine studies and recreational safety.

**Image No. 13: Sampling Locations of Weather & Climate Component**



**Table No. 23: Qualitative and Quantitative Characteristics of Weather and Climate at YCCE**

Sr. No.	Location	Air Temp (°C) Min.-max.	Relative Humidity (%)	UV Index	Pressure KPa	Wind Speed Km/hr	Wind Chill (%)	Dew Point (°C)	Cloud Cover (%)
1)	L1	22-28	70	4	1018	1.11	25	13	28
2)	L2	24-29	72	6.5	1017	0.96	24	15	32
3)	L3	18-26	65	6	1018	0.96	25	14	36
4)	L4	17-22	46	5.8	1019	1.1	25	15	30
5)	L5	21-29	57	5.8	1016	1.11	26	14	29
6)	L6	23-30	45	6.7	1017	0.58	26	12	34
7)	L7	19-27	40	5.7	1019	1.11	27	12	35
8)	L8	28-29	47	7.1	1016	0.76	26	13	36
9)	L9	18-26	39	5.9	1018	0.83	25	15	38
10)	L10	15-24	45	8	1016	0.81	26	14	32
	Mean	20.50-28.63	52.60	6.15	75.14	0.93	25.50	13.70	33.00
	Std. Dev.	3.87-5.96	12.41	1.05	0.011	0.18	0.85	1.16	3.33

**Observation & Recommendations**

- 1) Regularly audit and validate weather and climate data sources to ensure accuracy of different weather conditions.
- 2) Weather monitoring instruments like thermometer, humidity meter, should be maintain in the campus and are calibrated regularly to maintain accuracy.
- 3) Communicate with nearby public societies to enhance awareness of weather and climate data quality and reliability.
- 4) Continuously assess and update procedures to adapt to changing climate conditions.

## 6.0 Soil Audit

Soil is important as a medium for plant growth and for the support of much animal and human activity. The Soil acts as the reservoir for the nutrients and water providing the plant's needs for these requirements throughout their growth. Indeed soil (and the soil constituents), together with the plant life it supports, the rock on which it lies, and the climate it experiences, forms a finely balanced system.

The soil performs many functions. These include functions related to natural ecosystems, agricultural productivity, and environmental quality, soil as source of raw materials and as base for buildings. Of these the agricultural productivity function is probably the most widely recognized and understood. This function of soil is to support plant and animal productivity whilst maintaining or enhancing water and air quality and also supporting human health and habitation. To perform this production function, the soil must be able to provide the following: a physical, chemical and biological context suitable for the survival and development of living organisms; the conditions for the regulation and partitioning of water flow, storage and recycling of nutrients and other elements; conditions to support biological activity and diversity for plant growth and animal productivity; an environment to filter, buffer, degrade, immobilize, and detoxify organic and inorganic substances; and provide mechanical support for living organisms and their structures.

The soil samples were collected from different locations within the YCCE campus by random sampling method and then further these samples were equilibrated by quartering and coning method. Further the big stones and mud balls were removed and the soil was sieved through the fine sieve and then was subjected for further qualitative and quantitative physico-chemical analysis.

**Image No. 14: Sampling Locations of Soil Component**



**Table No. 24: Standard Soil Classification**

Sr. No.	Soil Tests	Range	Classification
1)	pH	<4.5	Extremely acidic
		4.51-5.50	Very strongly acidic
		5.51-6.00	Moderately acidic
		6.01-6.50	Slightly acidic
		6.51-7.30	Neutral
		7.31-7.80	Slightly alkaline
		7.81-8.50	Moderately alkaline
		8.51-9.00	Strongly alkaline
		9.01	Very strongly alkaline
2)	Salinity (mmhos/cm), (1ppm=640 mmhos/cm)	Upto 1.00	Average
		1.01-2.00	Harmful to germination
		2.01-3.00	Harmful to crops
3)	Organic carbon (%)	Upto 0.2	Very Less (for crops)
		0.21-0.4	Less
		0.41-0.6	Medium
		0.61-0.8	On an average sufficient
		0.81-1.0	Sufficient
		>1.0	More than sufficient
4)	Nitrogen (Kg/ha)	Upto 50	Very Less (for crops)
		51-100	Less
		101-105	Good
		151-300	Better
		>300	Sufficient
5)	Phosphorus (Kg/ha)	Upto 15	Very Less (for crops)
		16-30	Less
		31-50	Medium
		51-65	On an average sufficient
		66-85	Sufficient
		>80	More than sufficient
6)	Potash (Kg/ha)	0-120	Very Less (for crops)
		121-180	Less
		181-240	Medium
		241-300	Average
		301-360	Better
		>360	More than sufficient



**Table No. 25: Qualitative and Quantitative Characteristics of Soil at YCCE**

Sr. No.	Parameters	Units	Results	Method Reference
1)	pH		8.60	Manual of Soil Testing, Department of Agriculture & Co-operation, Ministry of Agriculture, Govt. India, Sec.4-17, Page No 89.
2)	Electrical Conductivity	mS/cm	0.16	
3)	Organic Carbon	(%)	1.08	
4)	Nitrogen	Kg/ha	213.25	FAO Sec. III, 12-1; Page No. 157
5)	Phosphorus	Kg/ha (P)	34.87	
6)	Potassium	Kg/ha (K)	716.08	Manual of Soil Testing, Department of Agriculture & Co-operation, Ministry of Agriculture, Govt. India, Sec.4-17, Page No 89.
7)	Calcium Carbonate	(%)	4.12	
8)	Calcium	(meq %)	33.12	
9)	Magnesium	(meq %)	19.27	
10)	Sodium	(meq %)	24.16	
11)	Coarse Sand	(%)	30.75	
12)	Clay	(%)	43.40	
13)	Silt	(%)	25.85	
14)	Fine sand	(%)	69.25	
15)	Moisture	(%)	5.36	
16)	Water holding Capacity	(%)	38.32	
17)	Apparent Density	(gm/cc)	1.56	
18)	Specific Density	(gm/cc)	2.67	Manual of Soil Testing, Department of Agriculture & Co-operation, Ministry of Agriculture, Govt. India, Sec.4-17, Page No 89.
19)	Pore Space	(%)	59.11	
20)	Volume Expansion Percent	(%)	27.50	
21)	Texture		1.00	

### **Observation & Recommendations**

- 1) Use organic or inorganic mulches to cover the soil surface and reduce water evaporation, erosion, and weed growth.
- 2) No-till practices to be adopted to minimize soil disturbance and maintain soil structure. Conservation tillage helps in preserving soil moisture, reducing erosion, and promoting organic matter retention.
- 3) Assess the current water management practices and suggest improvements to avoid waterlogging or excessive drainage. Proper irrigation scheduling and drainage systems can help maintain optimal soil moisture levels.
- 4) Recommend regular soil testing to assess nutrient levels and pH. Develop nutrient management plans to optimize fertilizer use and prevent over-application, reducing the risk of nutrient runoff.

## 7.0 Vegetation Audit: Flora Diversity

Trees play a critical role for people and the planet. Numerous studies have demonstrated that the presence of trees and urban nature can improve people's mental and physical health, children's attention and test scores, the property values in a neighbourhood, and beyond. Trees cool our urban centers. Trees are essential for healthy communities and people. The benefits that trees provide can help cities and countries meet 15 of the 17 internationally supported United Nations Sustainable Development Goals. Trees provide many ecosystem services that can benefit a city environment, ranging from reducing energy use and removing pollution to increasing property values, developing the local economy, and supporting tourism. One of the most important benefits for human health that urban forests can provide is the interception and reduction of air pollution. Tree cover is strongly linked to student academic performance. In a study, views of trees and shrubs at schools, as opposed to grass, were strongly related to future education plans and graduation rates found that students who had views of trees and green environment from their classrooms, as compared to being in a room without windows or a room with a view of a brick wall, scored substantially higher on tests measuring attention, and they had a faster recovery from a stressful event. Students who learn in the presence of trees and nature have improved classroom engagement. Trees can promote a quality education, which has innumerable advantages for society. Campus is located in the vicinity of approximately 155 types (species) trees. Various tree plantation programs are being organized during the month of July and August at college campus and surrounding villages. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental and medicinal. Instead of maintaining biodiversity the similar species planted is observed for example "NEEM". The dominant species in green belt are Neem, Pongam Tree, Amaltash, Copperpod and Sita Ashok. The Flora component was studied by observation and identification method. The vegetation was further categorized as: Shrubs, Ornamental Species, Medicinal Species and Tree Species. The tree species are marked with their geospatial data in map to generate the no. of individual per species present in the YCCE campus. This shall help to generate the highly dominant species.

**Image No. 15: Locations of Vegetation Component (Medicinal Species)**



**Image No. 16: Locations of Vegetation Component (Ornamental Species)**



Image No. 17: Locations of Vegetation Component (Shrubs Species)



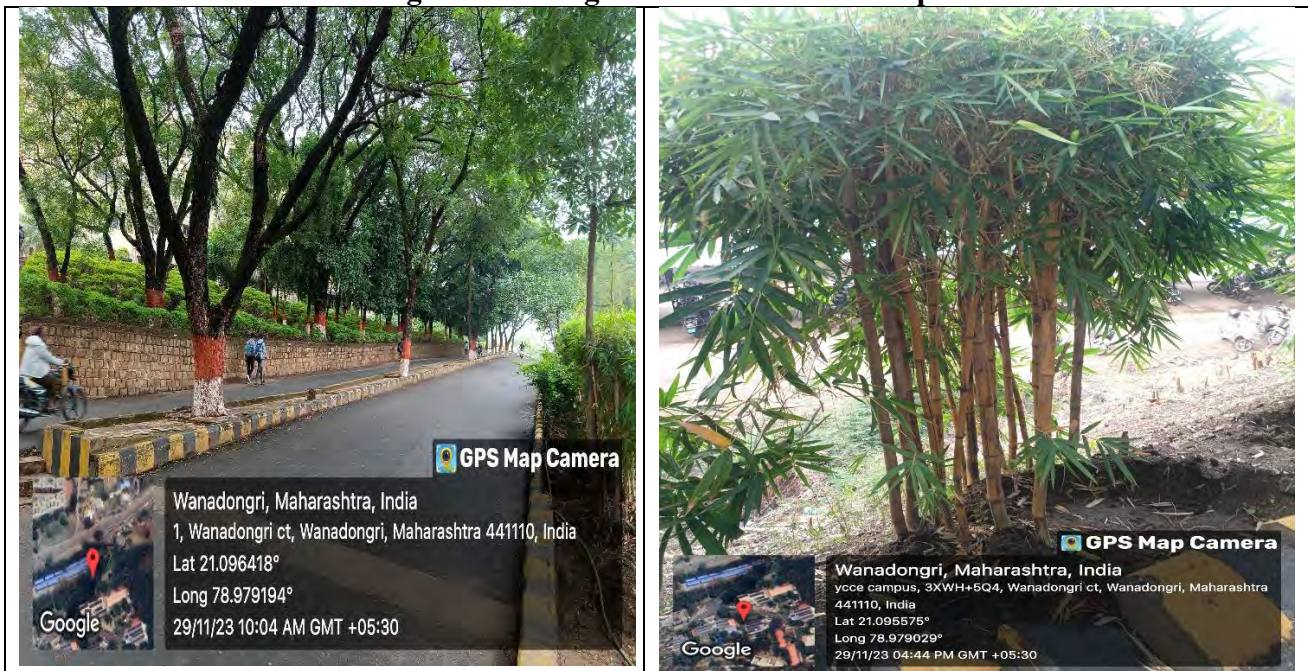
Image No. 18: Locations of Vegetation Component (Tree Species)



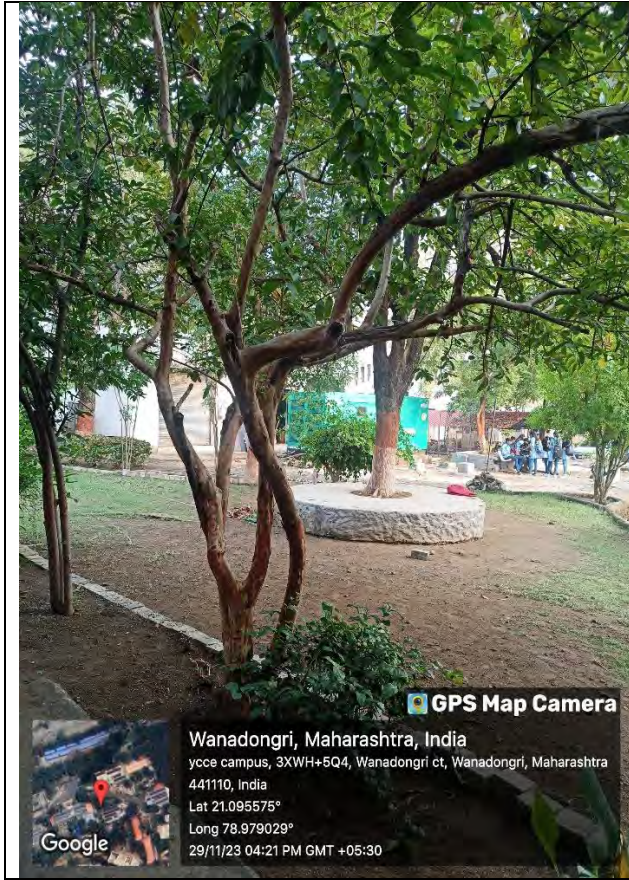
**Image No. 19: Locations of All Vegetation in Campus**



**Image No. 20: Vegetation Pics in the Campus**









**Table No. 26: Vegetation at YCCE: IJ Medicinal Species**

Sr. No.	Scientific Name	Common Name	Total Species
1)	Celastrus orbiculatus Thunb	Oriental bittersweet	7
2)	Azadirachta indica	Neem	58
3)	Phyllanthus amarus	Carry me seed	1
<b>Total</b>			<b>66</b>

**Table No. 27: Relative Density of Medicinal Species**

Sr. No.	Scientific Name	Common Name	No. of Individual	Relative Density
1)	Celastrus orbiculatus Thunb	Oriental bittersweet	7	10.60
2)	Azadirachta indica	Neem	58	87.87
3)	Phyllanthus amarus	Carry me seed	1	1.51

**Table No. 28: Vegetation at YCCE: IIJ Ornamental Species**

Sr. No.	Scientific Name	Common Name	Total Species
1)	Amelanchier laevis	Juneberry	20
2)	Bougainvillea spectabilis	Great bougainvillea	11
3)	Thevetia neriifolia	Yellow oleander	5
4)	Bougainvillea spectabilis	Great Bougainvillea	1
5)	Duranta erecta	Golden dewdrop	12
6)	Ixora coccinea	Ixora	2
7)	Murraya paniculata	Orange jasmin	1
8)	Agave desmettiana Jacobi	Dwarf century plant	11
9)	Agave sisalana Perrine	Mescal	3
10)	Bougainvillea spectabilis Wild	Great bougainvillea	32
11)	Duranta erecta L.	Golden dewdrops	25
12)	Euphorbia characias L.	Mediterranean spurge	13
13)	Hibiscus rosa-sinensis L.	Hawaiian hibiscus	5
14)	Phymosia umbellata	Mexican Bush Mallow	3
15)	Tecoma stans (L.) juss. Ex Kunth	Yellow-bells	2
16)	Acalypha wilkesiana	Copperleaf	11
17)	Agave sisalana perrine	Mescal	5
18)	Agave vivipara	Garden sisal	6
19)	Alternanthera brasiliana	Ruby leaf	2
20)	Bougainvillea glabra	Bougainvillea	11
21)	Bougainvillea spectabilis	Great baugainvillea	26
22)	Breniya disticha	Foliage flower	1
23)	Callistemon citrinus	Crimson bottlebrush	3
24)	Canna indica	Canna lily	5
25)	Carex morrowii Booty	Japanese sedge	1
26)	Cascabela thevetia	Yellow oleander	25
27)	Catharanthus roseus	Periwinkle	16

28)	<i>Cestrum nocturnum</i>	Night jasmine	1
29)	<i>Chlorophytum comosum</i>	Spider plant	3
30)	<i>Codiaeum variegatum</i>	Croton	4
31)	<i>Cordyline fruticosa</i>	Broadleaf palm lily	1
32)	<i>Cycas revoluta</i>	Sago palm	2
33)	<i>Duranta erecta</i>	Golden dewdrop	147
34)	<i>Furcraea foetida</i>	Mauritius hemp	17
35)	<i>Heliconia rostrata</i>	Lobster claw	3
36)	<i>Hibiscus rosa sinensis</i>	Hawaiian hibiscus	19
37)	<i>Ixora coccinea</i>	Ixora	14
38)	<i>Jacaranda mimosifolia</i>	Blue jacaranda	1
39)	<i>Lagerstroemia indica</i>	Crapemyrtle	1
40)	<i>Lantana .montevidensis</i>	Purple lantana	2
41)	<i>Lantana camara</i>	Lantana	2
42)	<i>Murraya paniculata</i>	Orange jasmine	9
43)	<i>Neomarica gracilis</i>	Brazilian walking iris	9
44)	<i>Peltophorum pterocarpum</i>	Copper Rod	1
45)	<i>Pereskia grandifolia</i>	Rose Cactus	2
46)	<i>Rosa chinensis</i>	Bengal rose	2
47)	<i>Rosa gallica</i>	Hungarian rose	3
48)	<i>Rosmarinus officinalis</i>	Rosemary	1
49)	<i>Sphagneticola trilobata</i>	Wedelia	6
50)	<i>Tecoma stans</i>	Yellow bells	18
51)	<i>Thunbergia grandiflora</i>	Blue skyflower	1
52)	<i>Yucca filamentosa</i>	Adams needle	1
53)	<i>Yucca gloriosa</i>	Spanish dagger	1
<b>Total</b>			<b>617</b>

Table No. 29: Relative Density of Ornamental Species

Sr. No.	Scientific Name	Common Name	No. of Individual	Relative Density
1)	<i>Amelanchier laevis</i>	Juneberry	20	3.241
2)	<i>Bougainvillea spectabilis</i>	Great bougainvillea	11	1.783
3)	<i>Thevetia neriifolia</i>	Yellow oleander	5	0.810
4)	<i>Bougainvillea spectabilis</i>	Great Bougainvillea	1	0.162
5)	<i>Duranta erecta</i>	Golden dewdrop	12	1.945
6)	<i>Ixora coccinea</i>	Ixora	2	0.324
7)	<i>Murraya paniculata</i>	Orange jasmin	1	0.162
8)	<i>Agave desmettiana Jacobi</i>	Dwarf century plant	11	1.783
9)	<i>Agave sisalana Perrine</i>	Mescal	3	0.486
10)	<i>Bougainvillea spectabilis</i>	Great bougainvillea	32	5.186
11)	<i>Duranta erecta L.</i>	Golden dewdrops	25	4.052
12)	<i>Euphorbia characias L.</i>	Mediterranean spurge	13	2.107
13)	<i>Hibiscus rosa-sinensis L.</i>	Hawaiian hibiscus	5	0.810

14)	<i>Phymosia umbellata</i>	Mexican Bush Mallow	3	0.486
15)	<i>Tecoma stans</i> (L.) juss. Ex	Yellow-bells	2	0.324
16)	<i>Acalypha wilkesiana</i>	Copperleaf	11	1.783
17)	<i>Agave sisalana</i> perrine	Mescal	5	0.810
18)	<i>Agave vivipara</i>	Garden sisal	6	0.972
19)	<i>Alternanthera brasiliana</i>	Ruby leaf	2	0.324
20)	<i>Bougainvillea glabra</i>	Bougainvillea	11	1.783
21)	<i>Bougainvillea spectabilis</i>	Great baugainvillea	26	4.214
22)	<i>Breniya disticha</i>	Foliage flower	1	0.162
23)	<i>Callistemon citrinus</i>	Crimson bottlebrush	3	0.486
24)	<i>Canna indica</i>	Canna lily	5	0.810
25)	<i>Carex morrowii</i> Booty	Japanese sedge	1	0.162
26)	<i>Cascabela thevetia</i>	Yellow oleander	25	4.052
27)	<i>Catharanthus roseus</i>	Periwinkle	16	2.593
28)	<i>Cestrum nocturnum</i>	Night jasmine	1	0.162
29)	<i>Chlorophytum comosum</i>	Spider plant	3	0.486
30)	<i>Codiaeum variegatum</i>	Croton	4	0.648
31)	<i>Cordyline fruticosa</i>	Broadleaf palm lily	1	0.162
32)	<i>Cycas revoluta</i>	Sago palm	2	0.324
33)	<i>Duranta erecta</i>	Golden dewdrop	147	23.825
34)	<i>Furcraea foetida</i>	Mauritius hemp	17	2.755
35)	<i>Heliconia rostrata</i>	Lobster claw	3	0.486
36)	<i>Hibiscus rosa sinensis</i>	Hawaiian hibiscus	19	3.079
37)	<i>Ixora coccinea</i>	Ixora	14	2.269
38)	<i>Jacaranda mimosifolia</i>	Blue jacaranda	1	0.162
39)	<i>Lagerstroemia indica</i>	Crapemyrtle	1	0.162
40)	<i>Lantana .montevidensis</i>	Purple lantana	2	0.324
41)	<i>Lantana camara</i>	Lantana	2	0.324
42)	<i>Murraya paniculata</i>	Orange jasmine	9	1.459
43)	<i>Neomarica gracilis</i>	Brazilian walking iris	9	1.459
44)	<i>Peltophorum pterocarpum</i>	Copper Rod	1	0.162
45)	<i>Pereskia grandifolia</i>	Rose Cactus	2	0.324
46)	<i>Rosa chinensis</i>	Bengal rose	2	0.324
47)	<i>Rosa gallica</i>	Hungarian rose	3	0.486
48)	<i>Rosmarinus officinalis</i>	Rosemary	1	0.162
49)	<i>Sphagneticola trilobata</i>	Wedelia	6	0.972
50)	<i>Tecoma stans</i>	Yellow bells	18	2.917
51)	<i>Thunbergia grandiflora</i>	Blue skyflower	1	0.162
52)	<i>Yucca filamentosa</i>	Adams needle	1	0.162
53)	<i>Yucca gloriosa</i>	Spanish dagger	1	0.162

**Table No. 30: Vegetation at YCCE: III] Shrubs Species**

<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Total Species</b>
1)	<i>Coffea arabica</i> L.	Arabian coffee	11
2)	<i>Comoclinium coelestinum</i>	Blue mist flower	29
3)	<i>Jasminium sambac</i>	Arabian jasmin	49
4)	<i>Leucaena leucocephala</i>	Coffeebush	6
5)	<i>Pseuderanthemum carruthersii</i>	Purple false erranthernum	5
6)	<i>Acalypha indica</i>	Indian Copperleaf	6
7)	<i>Buglossoides purpuro caerulea</i>	Purple gromwell	8
8)	<i>Cardiospermum halicacabum</i>	Ballon vine	11
9)	<i>Carissa carandas</i>	Karandang	4
10)	<i>Cordia myxa</i>	Sebesten plum	2
11)	<i>Cyanthillium cinereum</i>	Little ironweed	5
12)	<i>Desmodium paniculatum</i>	Panicled tick clover	9
13)	<i>Galphimia glauca</i>	Gold shower	13
14)	<i>Hamelia patens</i>	Redhead	8
15)	<i>Iris foetidissima</i>	Stinking Iris	5
16)	<i>Lactuca virosa</i>	Bitter lettuce	6
17)	<i>Leucaena leucocephala</i>	Coffee bush	14
18)	<i>Ligustrum vulgare</i>	Common privet	25
19)	<i>Mirabilis jalapa</i>	Four o' clock flower	2
20)	<i>Myoporum tenuifolium</i>	Manatoka	4
21)	<i>Nerium oleander</i>	Oleander	1
22)	<i>Nerium oleander</i>	Oleander	8
23)	<i>Plumbago auriculata</i>	Plumbago	5
24)	<i>Podranea ricasoliana</i>	Queen of sheba vine	3
25)	<i>Pseuderanthemum carruthersii</i>	Purple False Eranthemum	2
26)	<i>Ruscus aculeatus</i>	Box holly	5
27)	<i>Senna occidentalis</i>	Antbush	3
28)	<i>Syringa vulgaris</i>	Lilac	4
29)	<i>Tabernaemontana 92orficate92</i>	Crape jasmine	9
30)	<i>Tridax procumbens</i>	Coatbuttons	12
<b>Total</b>			<b>274</b>

**Table No. 31: Relative Density of Shrub Species**

Sr. No.	Scientific Name	Common Name	No. of Individual	Relative Density
1)	<i>Coffea arabica</i> L.	Arabian coffee	11	4.015
2)	<i>Comoclinium coelestinum</i>	Blue mist flower	29	10.584
3)	<i>Jasminium sambac</i>	Arabian jasmin	49	17.883
4)	<i>Leucaena leucocephala</i>	Coffeebush	6	2.190
5)	<i>Pseuderanthemum carruthersii</i>	Purple false erranthemum	5	1.825
6)	<i>Acalypha indica</i>	Indian Copperleaf	6	2.190
7)	<i>Buglossoides purpureo caerulea</i>	Purple gromwell	8	2.920
8)	<i>Cardiospermum halicacabum</i>	Ballon vine	11	4.015
9)	<i>Carissa carandas</i>	Karandang	4	1.460
10)	<i>Cordia myxa</i>	Sebesten plum	2	0.730
11)	<i>Cyanthillium cinereum</i>	Little ironweed	5	1.825
12)	<i>Desmodium paniculatum</i>	Panicled tick clover	9	3.285
13)	<i>Galphimia glauca</i>	Gold shower	13	4.745
14)	<i>Hamelia patens</i>	Redhead	8	2.920
15)	<i>Iris foetidissima</i>	Stinking Iris	5	1.825
16)	<i>Lactuca virosa</i>	Bitter lettuce	6	2.190
17)	<i>Leucaena leucocephala</i>	Coffee bush	14	5.109
18)	<i>Ligustrum vulgare</i>	Common privet	25	9.124
19)	<i>Mirabilis jalapa</i>	Four o' clock flower	2	0.730
20)	<i>Myoporum tenuifolium</i>	Manatoka	4	1.460
21)	<i>Nerium oleander</i>	Oleander	1	0.365
22)	<i>Nerium oleander</i>	Oleander	8	2.920
23)	<i>Plumbago auriculata</i>	Plumbago	5	1.825
24)	<i>Podranea ricasoliana</i>	Queen of sheba vine	3	1.095
25)	<i>Pseuderanthemum carruthersii</i>	Purple False Eranthemum	2	0.730
26)	<i>Ruscus aculeatus</i>	Box holly	5	1.825
27)	<i>Senna occidentalis</i>	Antbush	3	1.095
28)	<i>Syringa vulgaris</i>	Lilac	4	1.460
29)	<i>Tabernaemontana orficata</i>	Crape jasmine	9	3.285
30)	<i>Tridax procumbens</i>	Coatbuttons	12	4.380

**Table No. 32: Vegetation at YCCE: IV] Tree Species**

<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Total Species</b>
1)	Saraca asoca	Ashoka	112
2)	Ficus religiosa	Peepul	1
3)	Roystonea regia	Cuban royal palm	5
4)	Casuarina cunninghamiana	Beefwood	9
5)	Ficus cyanthistipula	African fig tree	2
6)	Syngonium podophyllum	Arrowhead vine	6
7)	Hymenocallis littoralis	Beach spider lily	1
8)	Ligustrum lucidum	Chinese privet	2
9)	Psidium guajava	Common guava	3
10)	Roystonea regia	Cuban royal palm	5
11)	Murraya koenigii	Curry leaf	8
12)	Alstonia scholaris	Dita bark	41
13)	Hyphene coriaceae	Doum palm	4
14)	Plumeria rubra	Frangipani	4
15)	Plumeria pudica	Golden arrow	4
16)	Lonicera japonica	Honeysuckle	4
17)	Washingtonia robusta	Mexican fan palm	4
18)	Bauhinia orficata	Orchid tree	4
19)	Ficus religiosa	Sacred fig	4
20)	Cycus revoluta	Sago palm	4
21)	Phoenix reclinata	Senegal date palm	4
22)	Annona squamosa	Sugar apple	4
23)	Citrus sinensis	Sweet orange	4
24)	Terminalia catappa	Tropical almond	4
25)	Schotia brachypetale	Weeping boer bean	4
26)	Platycladus orientalis	Chinese arborvitae	4
27)	Juniperus chinensis	Chinese juniper	4
28)	Thuja occidentalis	Northern white cedar	4
29)	Cupressus sempervirens	Mediterranean cypress	4
30)	Carica papaya	Papaya	4
31)	Alstonia scholaris	Ditabark	4
32)	Roystonea regia	Cuban royal palm	4
33)	Senna siamea	Siamese cassia	6
34)	Caesalpinia echinata	Brazil wood	15
35)	Albizia lebbeck	Frywood	2
36)	Alstonia scholaris	Devil tree	3
37)	Plumeria obtusa	Singapore graveyard	10
38)	Ficus benjamina	weeping fig	3
39)	Citrus aurantifolia	Sweet orange	4
40)	Campsis radican	Trumpet vine	7
41)	Terminalia catappa	Indian almond	5
42)	Bambusa vulgaris	Common bamboo	59

43)	<i>Alstonia scholaris</i>	Devil tree	6
44)	<i>Caesalpinia pulcherrima</i>	Peacock flower	19
45)	<i>Caryota urens</i>	Jaggery palm	11
46)	<i>Platycladus orientalis</i>	Chinese arborvitae	9
47)	<i>Platycladus orientalis</i>	Chinese arborvitae	26
48)	<i>Ficus cyanthistipula</i>	African fig tree	29
49)	<i>Bismarckia nobilis</i>	Silver Bismarck Palm	6
50)	<i>Duranta erecta</i>	golden dewdrop	19
51)	<i>Bombax ceiba</i>	Cotton tree	5
52)	<i>Ficus sycomorus</i>	Sycamore fig	9
53)	<i>Pongamia pinnata</i>	Indian beech	2
54)	<i>Ficus religiosa</i>	Sacred fig	9
55)	<i>Alstonia scholaris</i>	Ditabark	8
56)	<i>Magnolia grandiflora</i> L.	Southern magnolia	19
57)	<i>Juniperus thurifera</i> L.	Incense Juniper	7
58)	<i>Citrus sinensis</i> (L.)	Valencia orange	3
59)	<i>Ravenala madagascariensis</i>	Traveler's palm	13
60)	<i>Ficus benjamina</i>	Weeping fig	10
61)	<i>Terminalia catappa</i>	Tropical almond	5
62)	<i>Gleditsia triacanthos</i>	Honey locust	3
63)	<i>Senna siamea</i>	Ironwood Cassia	4
64)	<i>Rauvolfia caffra</i> Sond.	Quininetree	15
65)	<i>Psidium guajava</i> L.	Common guava	6
66)	<i>Roystonea regia</i> (Kunth)	Cuban royal palm	18
67)	<i>Tipuana tipu</i> (benth.) Kuntze	Tiputree	35
68)	<i>Theobroma cacao</i> L.	cocoa	39
69)	<i>Caesalpinia pulcherrima</i> (L.)Sw.	Pride-of-Barbados	14
70)	<i>Prosopis pallida</i> (wild.) Kunth	Kiawe	6
71)	<i>Ficus hispida</i> L.f.	Hairy fig	2
72)	<i>Dalbergia latifolia</i> Roxb.	East Indian rosewood	1
<b>Total</b>			<b>718</b>

**Table No. 33: Relative Density of Tree Species**

<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>No. of Individual</b>	<b>Relative Density</b>
1)	Saraca asoca	Ashoka	112	15.599
2)	Ficus religiosa	Peepul	1	0.139
3)	Roystonea regia	Cuban royal palm	5	0.696
4)	Casuarina cunninghamiana	Beefwood	9	1.253
5)	Ficus cyathistipula	African fig tree	2	0.279
6)	Syngonium podophyllum	Arrowhead vine	6	0.836
7)	Hymenocallis littoralis	Beach spider lily	1	0.139
8)	Ligustrum lucidum	Chinese privet	2	0.279
9)	Psidium guajava	Common guava	3	0.418
10)	Roystonea regia	Cuban royal palm	5	0.696
11)	Murraya koenigii	Curry leaf	8	1.114
12)	Alstonia scholaris	Dita bark	41	5.710
13)	Hyphene coriacea	Doum palm	4	0.557
14)	Plumeria rubra	Frangipani	4	0.557
15)	Plumeria pudica	Golden arrow	4	0.557
16)	Lonicera japonica	Honeysuckle	4	0.557
17)	Washingtonia robusta	Mexican fan palm	4	0.557
18)	Bauhinia orficata	Orchid tree	4	0.557
19)	Ficus religiosa	Sacred fig	4	0.557
20)	Cycus revoluta	Sago palm	4	0.557
21)	Phoenix reclinata	Senegal date palm	4	0.557
22)	Annona squamosa	Sugar apple	4	0.557
23)	Citrus sinensis	Sweet orange	4	0.557
24)	Terminalia catappa	Tropical almond	4	0.557
25)	Schotia brachypetale	Weeping boer bean	4	0.557
26)	Platycladus orientalis	Chinese arborvitae	4	0.557
27)	Juniperus chinensis	Chinese juniper	4	0.557
28)	Thuja occidentalis	Northern white cedar	4	0.557
29)	Cupressus sempervirens	Mediterranean cypress	4	0.557
30)	Carica papaya	Papaya	4	0.557
31)	Alstonia scholaris	Ditabark	4	0.557
32)	Roystonea regia	Cuban royal palm	4	0.557
33)	Senna siamea	Siamese cassia	6	0.836
34)	Caesalpinia echinata	Brazil wood	15	2.089
35)	Albizia lebbeck	Frywood	2	0.279
36)	Alstonia scholaris	Devil tree	3	0.418
37)	Plumeria obtusa	Singapore graveyard	10	1.393



38)	<i>Ficus benjamina</i>	weeping fig	3	0.418
39)	<i>Citrus aurantifolia</i>	Sweet orange	4	0.557
40)	<i>Campsis radican</i>	Trumpet vine	7	0.975
41)	<i>Terminalia catappa</i>	Indian almond	5	0.696
42)	<i>Bambusa vulgaris</i>	Common bamboo	59	8.217
43)	<i>Alstonia scholaris</i>	Devil tree	6	0.836
44)	<i>Caesalpinia pulcherrima</i>	Peacock flower	19	2.646
45)	<i>Caryota urens</i>	Jaggery palm	11	1.532
46)	<i>Platycladus orientalis</i>	Chinese arborvitae	9	1.253
47)	<i>Platycladus orientalis</i>	Chinese arborvitae	26	3.621
48)	<i>Ficus cyanthistipula</i>	African fig tree	29	4.039
49)	<i>Bismarckia nobilis</i>	Silver Bismarck Palm	6	0.836
50)	<i>Duranta erecta</i>	golden dewdrop	19	2.646
51)	<i>Bombax ceiba</i>	Cotton tree	5	0.696
52)	<i>Ficus sycomorus</i>	Sycamore fig	9	1.253
53)	<i>Pongamia pinnata</i>	Indian beech	2	0.279
54)	<i>Ficus religiosa</i>	Sacred fig	9	1.253
55)	<i>Alstonia scholaris</i>	Ditabark	8	1.114
56)	<i>Magnolia grandiflora</i> L.	Southern magnolia	19	2.646
57)	<i>Juniperus thurifera</i> L.	Incense Juniper	7	0.975
58)	<i>Citrus sinensis</i> (L.)	Valencia orange	3	0.418
59)	<i>Ravenala madagascariensis</i>	Traveler's palm	13	1.811
60)	<i>Ficus benjamina</i>	Weeping fig	10	1.393
61)	<i>Terminalia catappa</i>	Tropical almond	5	0.696
62)	<i>Gleditsia triacanthos</i>	Honey locust	3	0.418
63)	<i>Senna siamea</i>	Ironwood Cassia	4	0.557
64)	<i>Rauvolfia caffra</i> Sond.	Quininetree	15	2.089
65)	<i>Psidium guajava</i> L.	Common guava	6	0.836
66)	<i>Roystonea regia</i> (Kunth)	Cuban royal palm	18	2.507
67)	<i>Tipuana tipu</i> (benth.)	Tiputree	35	4.875
68)	<i>Theobroma cacao</i> L.	cocoa	39	5.432
69)	<i>Caesalpinia pulcherrima</i>	Pride-of-Barbados	14	1.950
70)	<i>Prosopis pallida</i> (wild.)	Kiawe	6	0.836
71)	<i>Ficus hispida</i> L.f.	Hairy fig	2	0.279
72)	<i>Dalbergia latifolia</i> Roxb.	East Indian rosewood	1	0.139

## **8.0 Vegetation Audit: Fauna Diversity**

The diversity of avifauna is one of the most important ecological indicators to evaluate the quality of habitats. Random destruction of natural habitats by cutting nesting trees and foraging plants for commercial use of woods and lands are the main factors responsible in narrowing down the avian foraging habitat and nesting sites. Urban bird densities are normally extremely high. Increase in bird densities may be the result of high food density, low predation pressure or combination of both. Birds are an essential animal group of an ecosystem that maintains a trophic level. Therefore, a detailed study on avifauna and their ecology is important to protect them.

Birds are considered excellent bio-indicators of the effects urbanization has on ecosystems since they are highly diverse and conspicuous elements of the ecosystems. Also, they respond rapidly to changes in landscape configuration, composition, and function. Comparative studies on avian community structure in different habitats can improve our knowledge of the general patterns and processes that characterize bird species and communities.

The fauna species were documented by observation and identification method during the field excursion. The observed species are photographed as evidence of presence in the YCCE campus. This data shall help understand the type of Ecological food chain existing in the environmental segment of YCCE.

Image No. 21: Sampling Area for Fauna Audit



Table No. 34: Bird Species at YCCE

List of Bird Species		
Sr. No.	Scientific Name	Common Name
1)	<i>Merops orientalis</i>	Asian green bee-eater
2)	<i>Columbia livia domestica</i>	Rock dove
3)	<i>Spilopelia senegalensis</i>	Laughing dove
4)	<i>Psittacula krameri</i>	Rose-ringed parakeet
5)	<i>Leptocoma zeylonica</i>	Purple-rumped sunbird
6)	<i>Pericrocotus cinnamomeus</i>	Small minivet
7)	<i>Halcyon smyrnensis</i>	White throated kingfisher
8)	<i>Dendrocitta vagabunda</i>	Rufous treepie
9)	<i>Turdoides striata</i>	Jungle Babbler
10)	<i>Saxicoloides fulicatus</i>	Indian Robin
11)	<i>Pycnonotus cafer</i>	Red-vented Bulbul
12)	<i>Dicrurus macrocercus</i>	Black drongo
13)	Trochilidae	Humming bird
14)	<i>Myadestes obscurus</i>	Oma'o
15)	<i>Cinnyris aiaticus</i>	Purple sunbird
16)	<i>Lonchura punctulata</i>	Scaly-breasted munia

**Table No. 35: Insect species at YCCE**

<b>List of Insect Species</b>		
<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>
1)	<u>Apis mellifera</u>	Western honey bee comb
2)	<u>Omocestus viridulus</u>	Green Grasshopper
3)	<u>Catopsilia florella</u>	African emigrant
4)	<u>Orthetrum sabina</u>	Slender Skimmer
5)	<u>Euthalia nais</u>	Baronet
6)	<u>Ariadne merione</u>	Common castor
7)	<u>Papilio demodocus</u>	Citrus swallowtail
8)	<u>Anisoptera</u>	Dragonfly
9)	<u>Appia libythea</u>	Stripped Albatross
10)	<u>Euploea core</u>	Common crow

**Table No. 36: Reptile Species at YCCE**

<b>List of Reptile Species</b>		
<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>
1)	Eutropis multifasciata	Many striped skink
2)	Anoplodesmus saussurii	Millipedes
3)	Sitana ponticeriana	Pondichery fan throated lizard
4)	Takydromus tachy deomoides	Grass lizard
5)	Achatina fulica	Giant African snail

**Table No. 37: Amphibian Species at YCCE**

<b>List of Amphibian Species</b>		
<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>
1)	Duttaphrynus melanostictus	Asian common toad
2)	Strongylopus grayii	Gray's steam frog

**Table No. 38: Rodent Species at YCCE**

<b>List of Rodent Species</b>		
<b>Sr. No.</b>	<b>Scientific Name</b>	<b>Common Name</b>
1)	Funambulus palmarum	Three-striped palm squirrel

**Observation & Recommendations**

- 1) The Green Belt is to be developed in the campus as the guidelines of NGT.
- 2) Total 33% area is to be reserved for plantation and to be planted in the area as per the guidelines of the CPCB.
- 3) The biodiversity is to be maintained while considering the plantation in future.
- 4) The selection of trees species to be based on environmental conservation and carbon sequestration value.
- 5) Artificial nests and water ponds are recommended to attract different birds in their migrating and breeding season.
- 6) Plant survival rate is to be maintained.
- 7) Watering schedule to be planned according to the season.
- 8) Drip irrigation is strongly recommended to conserve the water.
- 9) Reuse of the water shall be done instead of use of fresh water.
- 10) The care of the plant is to be maintained to enhance the aesthetic value of premises.
- 11) Special Tree Plantation shall be celebrated every year on environment day and also competitions for bird species identification and knowing the tree values in terms of medicinal and environment conservation.

## 9.0 Energy Audit: Electric Energy

Electricity is a basic part of nature and it is one of our most widely used forms of energy. Many cities and towns were built alongside waterfalls (a primary source of mechanical energy) that turned water wheels to perform work. An electric utility power station uses a turbine, engine, water wheel, or other similar machine to drive an electric generator or a device that converts mechanical or chemical energy to generate electricity. Electricity is measured in units of power called watts. It was named to honor James Watt, the inventor of the steam engine. The amount of electricity a power plant generates or a customer uses over a period of time is measured in kilowatt-hours (kWh). The electric energy component was analysed with due details about no. of units utilized daily/monthly and also department wise all the electrical equipment's utilizing electrical energy were enlisted with the amount of energy they utilize.

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

### **Aim and objective:**

- 1) To save conventionally produce electric energy
- 2) Use of non- conventional source of energy
- 3) Use carbon neutral electricity
- 4) Minimization of electric expenses

### **Observations**

Following Energy Sources are used in the college:

- Solar
- Electrical
- Diesel
- Petrol
- LPG

Energy conservation is the decision and practice of using less energy. Turning off the light when you leave the room, unplugging appliances when they are not in use and walking instead of driving are all examples of energy conservation. The two main reasons people conserve energy are to gain

more control over their energy bill and reduce the demand on the earth's natural resources. Energy conservation and efficiency may be related, but they have distinct definitions in the energy world. Energy conservation involves using less energy by adjusting your behaviours and habits. Energy efficiency, on the other hand, involves using technology that requires less energy to perform the same function. Energy-saving light bulbs, large household appliances, smart thermostats, and smart home hubs like Constellation Connect are all examples of technology that can be energy efficient. Energy resources utilized by all the departments, support services, and the administrative buildings of Yeshwantrao Chavan College of Engineering Nagpur, include Electricity, Solar Roof Top Systems, and Diesel Generators installed on the campus. Every time the Energy Audit is carried out it rekindles the interest in Energy Conservation as an important function.





52	Per day Hrs	7	7	7	7	7	7	7	1	1	24	24	2	12	7	7	7	7	2	2	2	2	2	1	1	1	2	2	1
53	Per Month KWH	2016	329.3	493.92	93.7	175.39	362.88	3200.4	19.2	7.2	172.8	115.2	4.8	604.8	40.3	1344	3360	84	24	179	768	134.4	358.1	4.32	134.28	48	35.808	177.6	0



**Table No. 41: List of Electrical Equipment's at Department of Electronics and Telecommunication Engg.**

Sr no.	Name of Lab	Fan 60 w	Tube light		LED 6 W	LED 18 w	CFL 36x2 W	CFL 18x2 w	Tube Light 36 w	PC	Printer	Projector	Monitor	Ducting Cooler	TV	Exhaust Fan	Wall Fan	AC Split	Speaker	CRO	Zero x M/C	Hand Drill m/c
			T5	20																		
<b>Ground Floor</b>																						
1	Electronics Device 01	6	2	7						10										6		
2	Cumunication Lab	11		4			6	4	5						8					10		
3	Micro vave Lab	9	5	8			1			1										10		
4	Programing 001A	12					10	6		41		1					1	1				
5	Digital Signal 002A	12					10	6		42		1	1				1	1				
6	Faculty Room	1		1						1							1					
7	Passage							10							1							
<b>First Floor</b>																						
8	Dept. Library119	3						10		1		1						2				
9	HOD Office 118	3						10		3	2		2					1			1	
10	Faculty Room 117	3		1		1		8		4	2							2				
11	Faculty Room 112	11		1		1	6	20		15	3			2		1	5					
<b>Second Floor</b>																						
12	ETC Dept.218	3		3				3	7	1							1					
13	Class Room 217	7	1	5				1	1		1											
14	Class Room 216	7		7				3	1		1											
15	Class Room 215	7	1	3				5	1		1											
16	Class Room 201	10					9	12		1		1							2			
17	Class Room 202	7				1	5	9		1		1										
18	Class Room 203	7		6				1	7			1										
<b>Third Floor</b>																						
19	Class Room318	3	1	1																		
20	PG Lab321	7	1	7				1	21	1												
21	Anolog Circuit 317	6	2	3					5											10		
22	Project Lab 322	6	2	2					6											3	2	
23	Class Room 316	6	10																			
24	Class Room 323	8	1	6																		
25	Class Room 324	3	2	2																		
26	Faculty Room 313	4					4	6		3							1					
27	Faculty Room 311	4					4	6		3	1											
28	Lab 309	4					4	12		5							1	1				
29	Conference Hall 304	16					8	17		1	1			2					4			
30	Class Room 308	6					6	2														
31	Micro Controler 307	6					6			23	1							1				
32	Toilet			1																		
33	Passage					3		23							1							
34	Total	198	28	68	0	6	79	161	19	198	12	9	3	4	9	3	11	9	6	39	1	2
35	Watts	60	28	20	6	18	72	36	36	150	100	100	100	2000	200	300	60	2000	100	50	500	100
36	Total Watts	11880	784	1360	0	108	5688	5796	684	29700	1200	900	300	8000	1800	900	660	18000	600	1950	500	200
37	Per day Hrs	7	7	7	2	7	7	7	7	7	2	2	24	2	2	12	7	7	2	2	2	1
38	Per MonthKWH	1995.8	132	228	0	18	955.6	974	115	4990	57.6	43.2	173	384	86.4	259.2	111	3024	29	93.6	24	4.8

Table No. 42: List of Electrical Equipment's at Department of Information Technology Engg.

Sr no.	Name of Lab	Fan 60 w	Tube light		CFL 1x18 w	LED 18 w	PC	Printer	Projector	Monitor	Ducting Cooler	TV	Exhaust Fan	Wall Fan	AC Split	Zero x M/C
			T5	20												
<b>Second Floor</b>																
1	Software Engg Lab	10			14		20									
2	Advance NetWorking	6			13		20									
3	Project Lab	10			14		21	1		1						
4	Staff Room	1			3	1	1									
5	Staff Room 2				8		2	1						3		
6	Ladies Toilet		2	2									1			
7	Passage				18						5	1				
8	HOD Office				11		2	2		1					1	1
9	Dept. Library	3			8		2		1						2	
10	ACL Lab	8			15		22	1						1	1	
11	Tutorial Room	3			8				1							
12	IT Staff Room 1	10			14		23									
<b>Third Floor</b>																
13	Open Source Lab	10			14		21		1							
14	Com. Program Lab2	7			13		20									
15	Com. Program Lab1	10			14		22			1						
16	Staff Room 3	2		2			5	1						3		
17	Gentes Staff Room															
18	Class Room 309		3	1												
19	Class Room 302	9	4	2					1							
20	Class Room 301	9	4	3					1							
21	Tutorial Room	9	3	5					1							
22	Passage	2	2	1					1							
23	311			8		6					3					
<b>First Floor</b>																
24	Class Room 102	6	1	3												
25	Class Room 107	6	2	3												
26	Class Room 105	6	2	3												
27	Toilet			2												
28	Passage		5	2												
29	Student Activity															
30	Engg Graphics															
31	<b>Total</b>	127	28	37	167	7	181	6	7	3	8	1	1	7	4	1
32	<b>Watts</b>	60	28	20	18	18	150	100	100	100	2000	200	300	60	2000	500
33	<b>Total Watts</b>	7620	784	740	3006	126	27150	600	700	300	16000	200	300	420	8000	500
34	<b>Per day Hrs</b>	7	7	7	7	7	7	1	2	24	2	2	12	7	7	2
35	<b>Per Month KWH</b>	1280	132	124	505	21	4561	14	33.6	173	768	9.6	86.4	70.6	1344	24



Table No. 44: List of Electrical Equipment's at Department of Mechanical Engg.

Sr no.	Name of Lab	Fan 60 w	Tube light				L 36x	18x2 w	PC	Printer	Sector	Monitor	Cooler	Exhaust Fan	Dow AC	AC Split	x M/C	ray M/C
			T5	36	36x 2	20												
<b>Ground Floor</b>																		
1	Mech Dept. Library	4		6		2		3	1									
2	Toilet 010					1							1					
3	Toilet 009					1							1					
4	Lab	4		1	3	2		3										
5	Class Room	2		2				1										
6	Cad Lab	11					24	36	1	1					3			1000
<b>First Floor</b>																		
8	HOD Office 109	2		1		1		1			2				1			
9	Staff Room 107	1				2			1	1								
10	Room No 108	1		2													1	
11	Class Room 106	8					6	1		1								
12	Class Room 101A	2		3														
13	Class Room 101B	2		2		2												
14	Staff Room 102	2	1	1		2		6	1									
15	Center of Excellence 105A+	2		6			6	10						4				
16	Lab 103	4		6														
17	Lab 104A	2	1	1		1												
18	Lab 104	5		10														
19	Passage	1		1		1						1						
20	Toilet Ladies 111					1							1					
21	Gentes Toilet 110			1									1					
<b>Second Floor</b>																		
22	Class Room 206	5	3	4		1												
23	Class Room 202	7	1	5														
24	Class Room 205	5		3		3												
25	Class Room 201	9					11											
26	Class Room 204	7		4		5							1					
27	Staff Room 203	2	1	1		2		3										
28	Staff Room 209	2				2		3										
29	Room No 208	1		1		1												
30	Room No 207	1		1		1												
31	Toilet 210					1							1					
32	Toilet 211					1							1					
<b>Third Floor</b>																		
33	Class Room 307	9				10												
34	Class Room 303	9				9												
35	Class Room 306	9				10												
36	Class Room 305	9				10												
37	Class Room 301	9				10												
38	Class Room 302	6				2		9										
39	Class Room 304	2				2		1	1									
40	Passage					6												
41	Boys Toilet					1												
42	Toilet 309					1												2
43	Staff Room 308	4				2												
44	<b>Total</b>	149	7	61	3	96	12	35	78	5	2	2	1	7	4	4	1	2
45	<b>Watts</b>	60	28	36	72	20	72	36	150	100	100	100	1500	300	2000	2000	500	1000
46	<b>Total Watts</b>	8940	196	###	216	###	864	1260	11700	500	200	200	1500	2100	8000	8000	500	2000
47	<b>Per day Hrs</b>	7	7	7	7	7	7	7	7	1	1	24	7	12	7	7	1	1
48	<b>Per Month KWH</b>	1502	33	369	36	323	145	212	1966	12	4.8	115	252	604.8	1344	1344	12	48

Table No. 45: List of Electrical Equipment's at Department of Electrical Engg.

Sr no.	Name of Lab	Fan 60 w	Tube light		LED	LED 15 w	LED 12 w	CFL 36x 2	CFL 18x2 w	PC	Printer	Projector	Wall Fan	Exhaust Fan	AC Split	Motor 5 hp	Load 5 kw	Reh ostate 500 w	Load 10 kw	Rheo state
			T5	36																
1	Ground Floor				20															
2	EL 001	2		1	2					2										
3	EL 002	8			9					10										
4	EL 003	2				2	2		9	3	2				1					
5	EL 004	4							12						2					
6	EL 005	4	1	5	26					26		1			2					
7	EL 012	4		7																1
8	EL 006	10	8	4	1					1						30	2	4	1	
9	EL 011	2																		
10	EL 007 A+B	8			40				24	40		1								
11	EL 010	2		8									7	2						
12	EL 008	4		10	1					1							1			
13	EL 009	4	1	7	1					1						8				
14	Passage			1																
15	Toilet & Pannel													1						
16	EL 101	2		1	2					2										
17	EL 102	4		6																
18	EL 103	7																		
19	Toilet 114 A													1						
20	Room No 202	2			4			5		4	2									
21	Staff Room	2			4			6		4			3							
22	Class Room 204	5		1																
23	EL 205 B	12	13																	
24	EL 212																			
25	EL 205A	6												1						
26	EL 213 B																			
27	EL 206	5																		
28	EL 207	6																		
29	EL 208	5		2																
30	Passage																			
31	EI 307	4							6											
32	ower Electronics La	5				5			5											
33	EL 310	5							7											
34	EL 311	7							9											
35	EL 312	2							8											
36	EL 308	4				2			6											
37	Passage					1			3											
38	Girls Toilet				1															
39	EI 304	8		6	2															
40	Total	145	23	59	93	10	2	11	89	94	4	2	10	5	5	38	3	4	1	1
41	Watts	60	28	36	20	15	12	72	36	150	100	100	60	300	2000	3730	5000	500	10000	200
42	Total Watts	8700	644	2124	1860	150	24	792	3204	14100	400	200	600	1500	10000	1E+05	15000	2000	10000	200
43	Per day Hrs	7	7	7	7	7	7	7	7	7	1	1	7	12	7	2	2	2	2	2
44	Per MonthKWH	1462	108	357	312	25	4	133	538	2369	9.6	4.8	101	432	1680	6804	720	96	480	9.6





**Table No. 47: Monthly utilization of Electricity at YCCE**

Sr. No.	Months /Year	Units	Bill Demand (KVA)	Amount (Rs)
1)	Apr-22	86916	455	1244096
2)	May-22	106979	559	1539163
3)	Jun-22	106330	481	1689799
4)	Jul-22	86029	455	1413216
5)	Aug-22	71685	455	1211347
6)	Sep-22	73892	455	1241274
7)	Oct-22	35874	455	733936
8)	Nov-22	34006	455	714927
9)	Dec-22	39066	455	778619
10)	Jan-23	33665	455	706404
11)	Feb-23	29634	423	649665
12)	Mar-23	53898	423	955350

**Table No. 48: Carbon Footprint based on Electrical Consumption**

Sr. No.	Months /Year	Total Units	Amount	CO <sub>2</sub> Emission (kt)
1)	Apr-22	86916	1244096	387
2)	May-22	106979	1539163	475
3)	Jun-22	106330	1689799	409
4)	Jul-22	86029	1413216	387
5)	Aug-22	71685	1211347	387
6)	Sep-22	73892	1241274	387
X`7)	Oct-22	35874	733936	387
8)	Nov-22	34006	714927	387
9)	Dec-22	39066	778619	387
10)	Jan-23	33665	706404	387
11)	Feb-23	29634	649665	360
12)	Mar-23	53898	955350	360

Emission factor – 0.85      kt - Kiloton

## 10.0 Energy Audit: Solar Energy

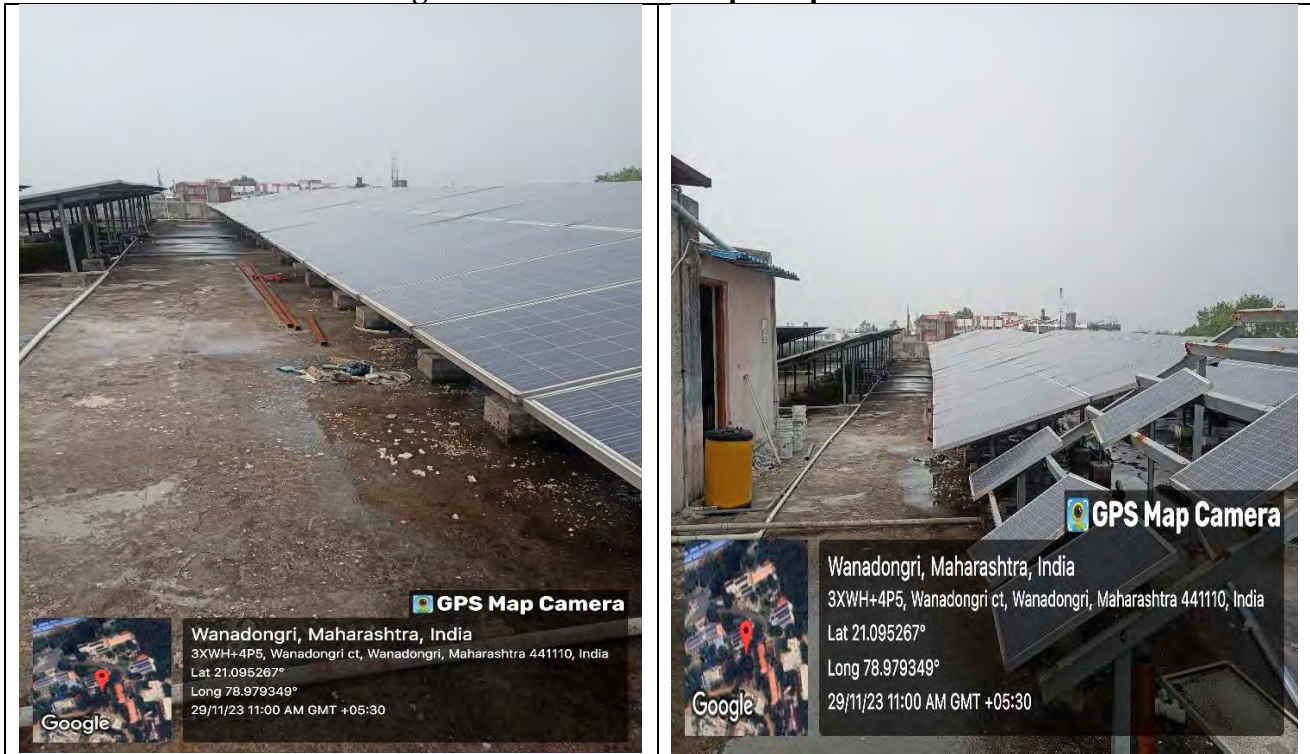
The sun is an incredible and renewable resource that has the power to fuel life on earth and provide clean, sustainable energy to all of its inhabitants. In fact, more energy from the sun reaches our planet in one hour than is used by the entire population of the world in one year. The sun's energy can be converted into electricity through solar photovoltaic (PV) modules. The potential for solar energy is enormous, since about 200,000 times the world's total daily electric-generating capacity is received by Earth every day in the form of solar energy. Unfortunately, though solar energy itself is free, the high cost of its collection, conversion, and storage still limits its exploitation in many places. Solar radiation can be converted either into thermal energy (heat) or into electrical energy, though the former is easier to accomplish. The college campus is having Solar panels installed on rooftop of each of the departmental building. The electricity generated is further directed to the adjacent polytechnic college premises where the required electric energy is utilized and the remaining unutilized is led to the power grid. The data regarding Solar energy generation was measured to understand the solar energy potential at YCCE campus.

**Table No. 49: Solar Energy Potential and CO<sub>2</sub> Emission at YCCE**

Sr. No.	Bill Month	Roof top solar net metering capacity (kW)	Total Solar Energy Generation	CO <sub>2</sub> Emission kt
1)	Apr-22	400	77271	65680
2)	May-22	400	82636	70241
3)	Jun-22	400	62269	52929
4)	Jul-22	400	38940	33099
5)	Aug-22	400	58313	49566
6)	Sep-22	400	55235	46950
7)	Oct-22	400	71138	60467
8)	Nov-22	400	67284	57191
9)	Dec-22	400	62809	53388
10)	Jan-23	400	66361	56407
11)	Feb-23	400	73904	62818
12)	Mar-23	400	79198	67318

\* kW – Kilo Watts  
 kt - Kiloton  
 Emission factor – 0.85

Image No. 22: Solar Rooftop setup at YCCE



## 11.0 Vehicle Audit

A vehicle audit is defined as a systematic procedure that obtains an adequate knowledge of existing energy consumption in vehicles. It helps to identify the factors that have an effect on the energy / power consumption by vehicles. The performance of an vehicle audit is the essential step to the energy efficiency and improvements. It is a procedure that helps to analyse the use of different types of fuels and its implication on environment. Following are the details of vehicle owned by YCCE and vehicle managed by staff and students.

**Table No. 50: Details of Vehicle owned by YCCE for Transportation**

Sr. No.	Vehicle No.	Make	Year of purchase	Seating Capacity	Fuel
1	MH 31 CQ 4296	SML	Jun-09	40	CNG
2	MH 31 EK 0747	Bolero	2013	7	Diesel
3	MH 31 CQ 8250	Tata 407	Sep-10	1+1	Diesel
4	MH 31 CQ 4294	SML	Jun-09	40	Diesel
5	MH 40 AT 0084	SML	RRA/July 2015	50	CNG
6	MH 40 AT 0124	SML	RRA/July 2015	50	Diesel
7	MH 40 Y 2169	SML	SMG REAL-2012	40	Diesel
8	MH 49 J 1072	Tata	Ladies Hostel/2017	50	Diesel
9	MH 31 CQ 4297	SML	RRA-2009	41	Diesel
10	MH 40 AT 0125	SML	RRA/July 2015	50	CNG

**Table No. 51: Vehicle Details**

SR. No.	Department	Four Wheeler	Two Wheeler
1	Civil Engineering	22	16
2	Mechanical Engineering	24	12
3	Computer Science Engineering	4	12
4	Computer Technology	19	15
5	Electrical Engineering	25	20
6	Electronics Engineering	15	16
7	Electronics and Telecommunication Engineering	18	6
8	Information Technology	9	23
9	Mathematics	6	15
10	Applied Physics	3	7
11	Applied Chemistry	2	9
12	Administrative Office + A/C	6	18
13	DAM	2	1

14	COE Office	3	7
15	Library	2	8
16	Maintenance	1	3
17	Store	0	1
<b>Total</b>		<b>161</b>	<b>189</b>

**Table No. 52: CO<sub>2</sub> emission of single bike**

Size of bike	kg of CO <sub>2</sub> e, per km	kg of CO <sub>2</sub> e, per mile
Small	0.08277kg	0.13321kg
Medium	0.10086kg	0.16230kg
Large	0.13237kg	0.21302kg
Average	0.11337kg	0.18245kg

## 12.0 Sound Audit

Sound is all around us and can be measured to inform and protect us, as some sounds are not safe. In fact, loud noise can be very damaging to hearing. The level of noise, where a person is in relation to the noise (distance to the noise), and the amount of time they listen to it can all result in risk for hearing loss. Sound can be measured with a device called a decibel meter. It samples and measures sound, giving a readout. Decibel meters (also called sound-level meters) can even be accessed on a smartphone through apps. Sound is measured in units called decibels (dB). The higher the decibel level, the louder the noise. On the decibel scale, the level increase of 10 means that a sound is actually 10 times more intense, or powerful. A Sound Level Meter (SLM) is an instrument (commonly hand-held) that is designed to measure sound levels in a standardized way. The noise level was measured at different locations within the campus to understand the noise pollution level points and the calm zones. This help understand the sound level conforms to the prescribed range in daytime and night time in the educational institute.

**Image No. 23: Locations of Sound Component**



**Table No. 53: Sound Level Standard**

<b>CPCB Standards of Noise Levels</b>					
<b>Rural</b>	<b>Sub-Urban</b>	<b>Residential (Urban)</b>	<b>Urban (Residential &amp; Business)</b>	<b>City</b>	<b>Industrial</b>
25-35	30-40	35-45	40-50	45-50	50-60

**Table No. 54: Noise Quality Standards**

<b>Noise level in Leq dB (A)</b>			
<b>S.N.</b>	<b>Area</b>	<b>Day Time</b>	<b>Night Time</b>
1)	Industrial Area	75	70
2)	Commercial Area	65	55
3)	Residential Area	55	45
4)	Silence Zone	50	40

Source: Notification of MoEF, dated 26-12-1989

**Note:**

1. Day time is reckoned between 6 a.m – 10 p.m
2. Night time is reckoned between 10 p.m – 6 a.m
3. Silence Zone is defined as areas upto 100 m around premises as hospitals, educational institutions and courts. The silence zones are to be declared by Competent Authority. Use of vehicular horns, loudspeakers and bursting of crackers shall be banned in these Zones.
4. Mixed categories of areas should be declared as one of the four above mentioned categories by the Competent Authority and the Corresponding standards shall apply.

Table No. 55: WHO Guidelines for Sound Level

Specific Environment	Time Base (hours)	Standards limits as per WHO guidelines	
		LAeq (dB)	LAm <sub>ax</sub> , fast (dB)
Outdoor living area	16	50-55	-
Dwelling, indoors, inside bedrooms	16	30	-
	8	35	45
Outside Bedrooms	8	45	60
School Classrooms and preschool, indoors	During class	35	-
Preschool bedrooms, indoors	Sleeping time	30	45
School playground, outdoors	During play	55	-
Hospital, ward rooms, indoors	8	30	40
	16	30	-
Hospital, Treatment rooms, indoors	-	As low as possible	-
Industrial Commercial, shopping and traffic areas, indoors and outdoors	24	70	110
Ceremonies, festivals and entertainment events	4	100	110
Public addresses, indoors and outdoors	1	85	110
Music through headphones and earphones	1	85 (under headphones, adapted to free-field valued)	110
Impulse sounds from toys, fireworks and firearms	-	-	120-140 ( peak sound pressure) not LAm <sub>ax</sub> , fast), measured 100 mm from the car)
Outdoor in parkland and conversation areas	-	Exiting quite outdoor areas should be preserved and the of intruding noise to natural background sound should be kept low	-



**Table No. 56: Quantitative Characteristics of Noise Level at YCCE**

<b>Sr. No.</b>	<b>Locations</b>	<b>Noise level (Day Time)</b>	<b>Noise level (Night Time)</b>
1)	Location 1	77 dB	45 dB
2)	Location 2	68 dB	42 dB
3)	Location 3	70 dB	48 dB
4)	Location 4	66 dB	47 dB
5)	Location 5	64 dB	43 dB
6)	Location 6	64 dB	45 dB
7)	Location 7	67 dB	46 dB
8)	Location 8	66 dB	49 dB
9)	Location 9	68 dB	51 dB
10)	Location 10	72 dB	50 dB

**Observation & Recommendations**

- 1) Encourage the staff and students to use Common or public Vehicle instead individual vehicle to conserve fossil fuel
- 2) Maximum Solar energy is recommended to use in mess and canteen
- 3) Carbon Sequestration study shall be carried out before plantation of Green Belt.
- 2) Energy Consumption for each building should be estimated to design the energy conservation plan.
- 4) Energy saving awareness shall be done by displaying the boards at appropriate place
- 5) Encourage natural ventilation and illumination by alteration in the building structures whenever going for new constructions
- 6) Prioritize energy-saving recommendations based on their cost-effectiveness and potential for energy savings. Identify quick wins and long-term strategies.
- 7) Explore the feasibility of alternative fuels (e.g., electric, hybrid, compressed natural gas) and advanced vehicle technologies. Consider transitioning to more fuel-efficient or environmentally friendly options.

- 8) Evaluate the cost-effectiveness of replacing older, less fuel-efficient vehicles with newer, more efficient models. Consider the total cost of ownership, including fuel, maintenance, and depreciation.
- 9) Determine critical areas where noise has the most significant impact on occupants or operations. Focus on mitigating noise in these priority zones.
- 10) Implement administrative controls, such as scheduling noisy activities during less sensitive times or creating designated quiet zones.
- 11) Educate occupants and staff about noise-related issues, the importance of adhering to noise control measures, and the benefits of a quieter environment.

### 13.0 Waste Audit: Institutional Municipal Solid Waste

Solid waste refers to the range of garbage materials arising from animal and human activities that are discarded as unwanted and useless. Solid waste is generated from industrial, residential, and commercial activities in a given area, and may be handled in a variety of ways. As such, landfills are typically classified as sanitary, municipal, construction and demolition, or industrial waste sites. Waste can be categorized based on material, such as plastic, paper, glass, metal, and organic waste. Categorization may also be based on hazard potential, including radioactive, flammable, infectious, toxic, or non-toxic wastes. Categories may also pertain to the origin of the waste, whether industrial, domestic, commercial, institutional, or construction and demolition. Regardless of the origin, content, or hazard potential, solid waste must be managed systematically to ensure environmental best practices. As solid waste management is a critical aspect of environmental hygiene, it must be incorporated into environmental planning. The Institutional Municipal Solid Waste data was generated with due consideration to the number of individuals per department and the duration of day they spend at each of the department.

Institutional Municipal Solid Waste (IMSW) Standard Unit = 0.147 kg/per person/day

**Image No. 24: Institutional Municipal Solid Waste Pit**



Image No. 25: Solid Waste pit at YCCE



Table No. 57: Institutional Municipal Solid Waste Generation (IMSW) at YCCE

Sr. No	Name of Department	Departmental sub- categories	Teaching Faculty	Non-Teaching Staff	Students UG+PG+ Ph. D	Total no. of Individuals	Solid waste generated per department (kg)/day
1)	Administrative Office		-	122	-	122	17.934
2)	Library		-	9	-	9	1.323
3)	Applied Science and Humanities		34	8	0+0+21	63	9.261
4)	Computer Technology	M.Tech. Computer Science & Engineering	27	5	480+30+9	569	80.997
5)	Electronics Engineering	M.Tech . Electronics Engineering	30	6	480+67+5	588	86.436

6)	Electronics & Telecommunication Engineering	M.Tech .Communication Engg	37	6	720+30+8	795	116.865
7)		M.tech .CAD-CAM					
8)	Electrical Engineering	M. Tech . Integrated Power Systems	46	4	660+30+5	793	109.515
9)	Information Technology		24	4	360+18+10	296	61.152
10)	Mechanical Engineering		47	1	660+43+6	817	111.279
11)	Civil Engineering	M.Tech Environmental Engg	50	7	660+86+9	829	119.364
		M.Tech . Structural Engg					
<b>Total</b>							<b>714.126</b>

Henceforth,

Total Institutional Municipal Solid Waste (IMSW) = 714.126 kg generated at YCCE per day

Waste generated for Session 2022-2023 = 714.126 kg\*365 days = 260655.99 kgs/yr

### 13.1 Institutional Municipal Solid Waste Management Plan

Developing an effective Institutional Municipal Solid Waste (MSW) Management Plan requires a comprehensive approach that considers waste generation, collection, transportation, processing, and disposal. Below are some key components and suggestions for creating such a plan:

#### a. Waste Characterization:

Conduct a thorough waste characterization study to understand the composition and quantity of different types of waste generated in the municipality.

#### b. Legal and Regulatory Framework:

Identify and comply with local, regional, and national regulations related to waste management.

Develop policies and guidelines for waste management in accordance with the regulatory framework.

**c. Institutional Structure:**

Establish a dedicated municipal solid waste management department or division responsible for planning, implementing, and monitoring waste management activities.

**d. Public Awareness and Education:**

Launch public awareness campaigns to educate residents about proper waste disposal practices, recycling, and the importance of reducing waste.

**e. Waste Collection:**

Design an efficient waste collection system, considering the frequency, routes, and types of collection (e.g., curbside pickup, drop-off points).

Implement separate collection for recyclables, organic waste, and non-recyclables.

**f. Waste Transportation:**

Develop a transportation plan to ensure timely and efficient movement of waste from collection points to processing facilities or disposal sites. Consider environmentally friendly transportation options.

**g. Waste Processing and Treatment:**

Establish or upgrade waste processing facilities, such as composting plants, recycling centers, and waste-to-energy facilities. Encourage the private sector to invest in innovative waste processing technologies.

**h. Landfill Management:**

Develop and implement measures to minimize the environmental impact of landfills, such as leachate control and gas collection systems. Explore options for landfill site remediation and closure.

**i. Waste Reduction and Recycling Programs:**

Promote and incentivize waste reduction at the source. Implement comprehensive recycling programs and provide facilities for residents and businesses to recycle.

**j. Monitoring and Reporting:**

Establish a robust monitoring and reporting system to track waste generation, collection efficiency, recycling rates, and other key performance indicators.

**k. Technology Integration:**

Explore the use of technology, such as smart bins, GPS tracking for waste collection vehicles, and mobile apps for citizen engagement.

**l. Collaboration and Partnerships:**

Collaborate with local businesses, NGOs, and community groups to enhance waste management efforts. Explore public-private partnerships for waste management services.

**m. Emergency Response Plan:**

Develop an emergency response plan for managing unexpected events, such as natural disasters or sudden increases in waste generation.

**n. Budget and Funding:**

Develop a sustainable funding model for waste management activities, considering user fees, grants, and partnerships.

**o. Periodic Review and Updating:**

Regularly review and update the waste management plan to adapt to changing circumstances, technologies, and regulations.

**13.2 E-Waste Management**

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. This makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment.

E-waste generated in the campus is very less in quantity. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E- waste and defective item from computer laboratory is being stored properly. The institution has decided to contact approved E-waste management and disposal facility in order to dispose E-waste in scientific manner.

## 14.0 Waste Audit- Municipal Sewage

Wastewater or sewage is the byproduct of many uses of water. There are the household uses such as showering, dishwashing, laundry and, of course, flushing the toilet. The sewer or collection system is designed so that it flows to a centralized treatment location. The collection system is comprised of smaller sewers with a diameter of about four inches. We need to remove the wastewater pollutants to protect the environment and protect public health. When water is used by our society, the water becomes contaminated with pollutants. If left untreated, these pollutants would negatively affect our water environment. For example, organic matter can cause oxygen depletion in lakes, rivers, and streams. Waterborne diseases are also eliminated through proper wastewater treatment. Sewerage (or sewage system) is the infrastructure that conveys sewage or surface runoff (storm water, rainwater) using sewers. It encompasses components such as receiving drains, manholes, pumping stations, storm overflows, and screening chambers of the combined sewer or sanitary sewer. Sewerage ends at the entry to a sewage treatment plant or at the point of discharge into the environment. It is the system of pipes, chambers, manholes, etc. that conveys the sewage or storm water.

The YCCE campus has a own Sewage Treatment Plant (STP) with 1,25000 lpd capacity with the regeneration of treated water further subjected to gardening and waging as well as flushing activities. The college has a combined type of efficient wastewater collection system well connected to all the departments and administration building for conveyance of wastewater. The downhill location of STP is selected to utilize the benefit of elevation and henceforth the conveyance of sewage and wastewater flows by gravity to STP.

The STP has inclusion of unit processes:

- 1) Primary Treatment
- 2) Secondary Treatment and
- 3) Tertiary Treatment



Image No. 26: Location of Sewage Treatment Plant

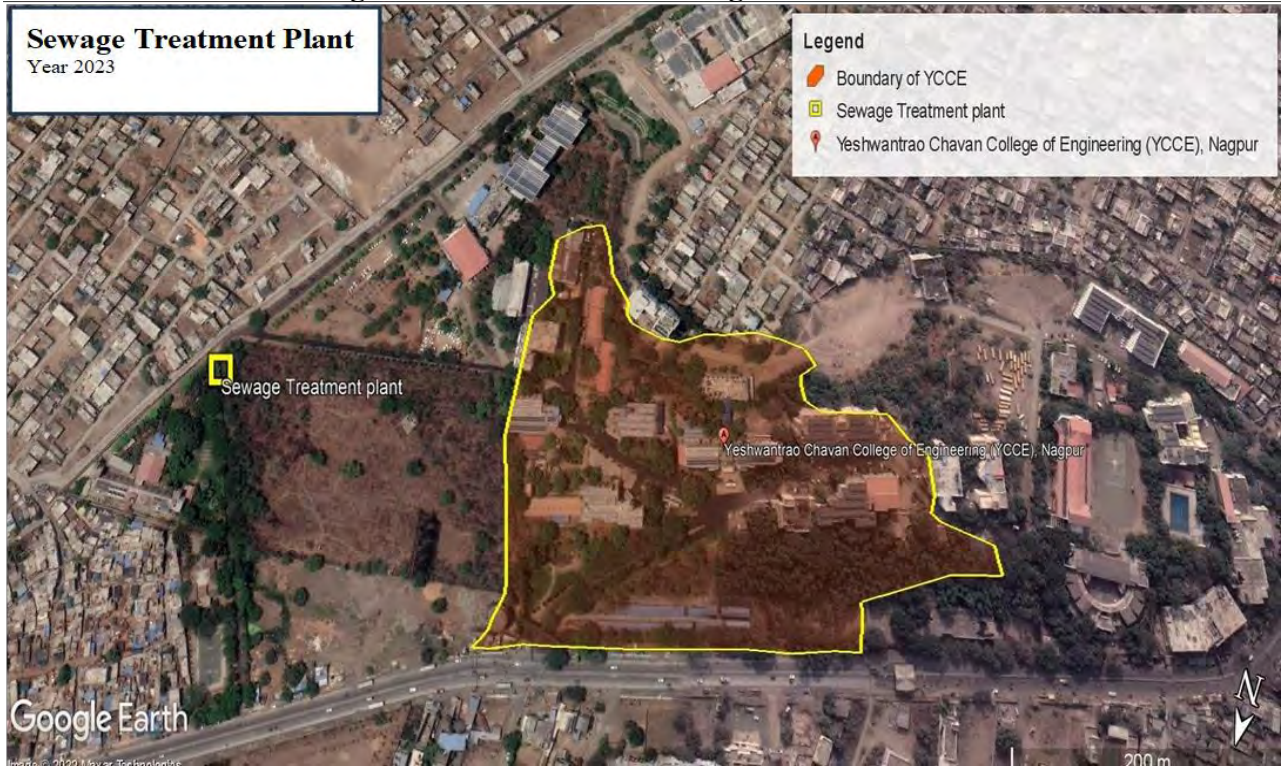


Image No. 27: Sewage Treatment Plant Design and Description

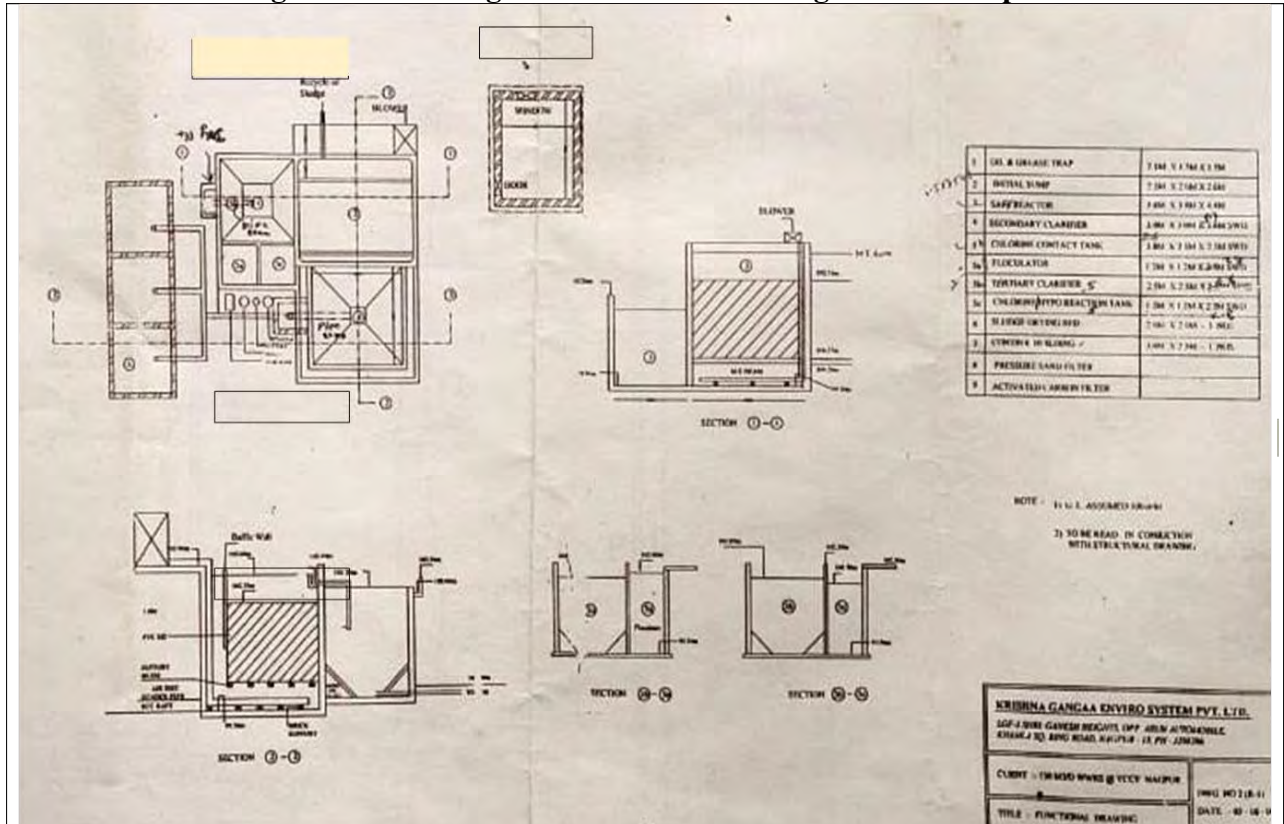


Image No. 28: Sewer Line Drainage Map

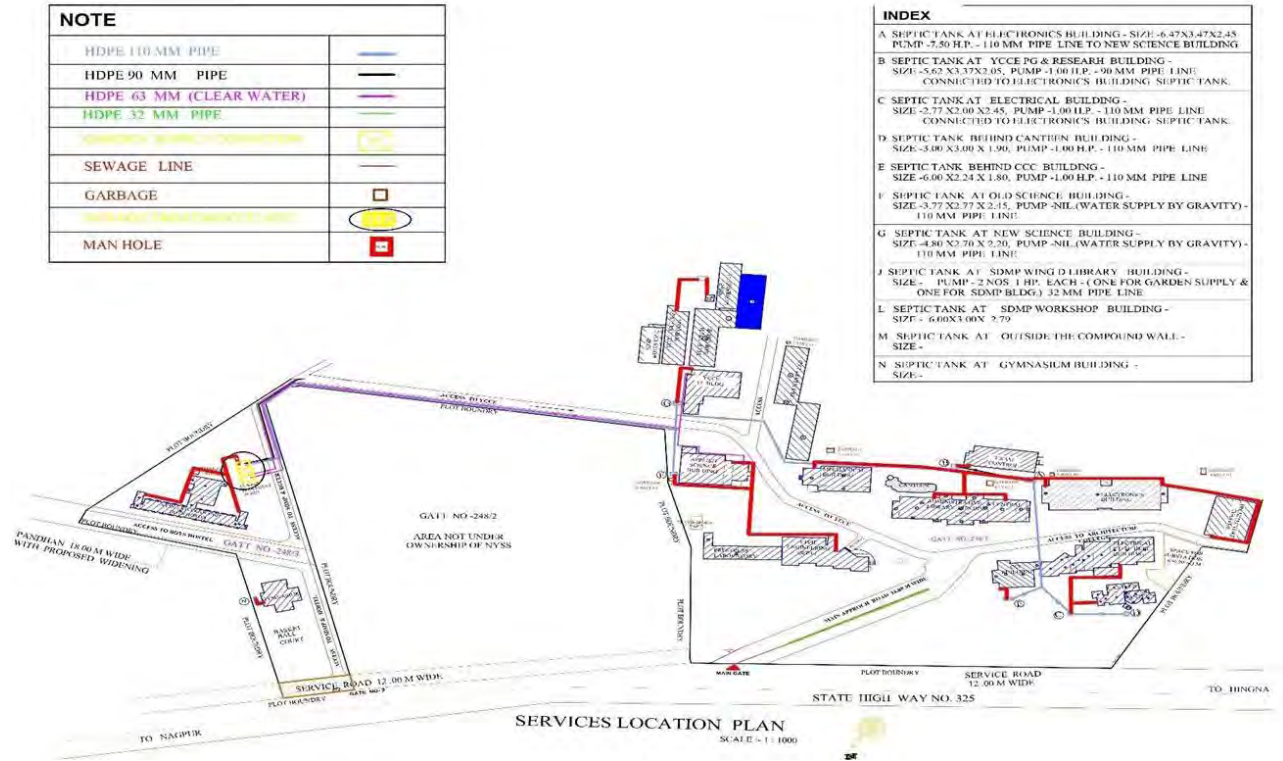
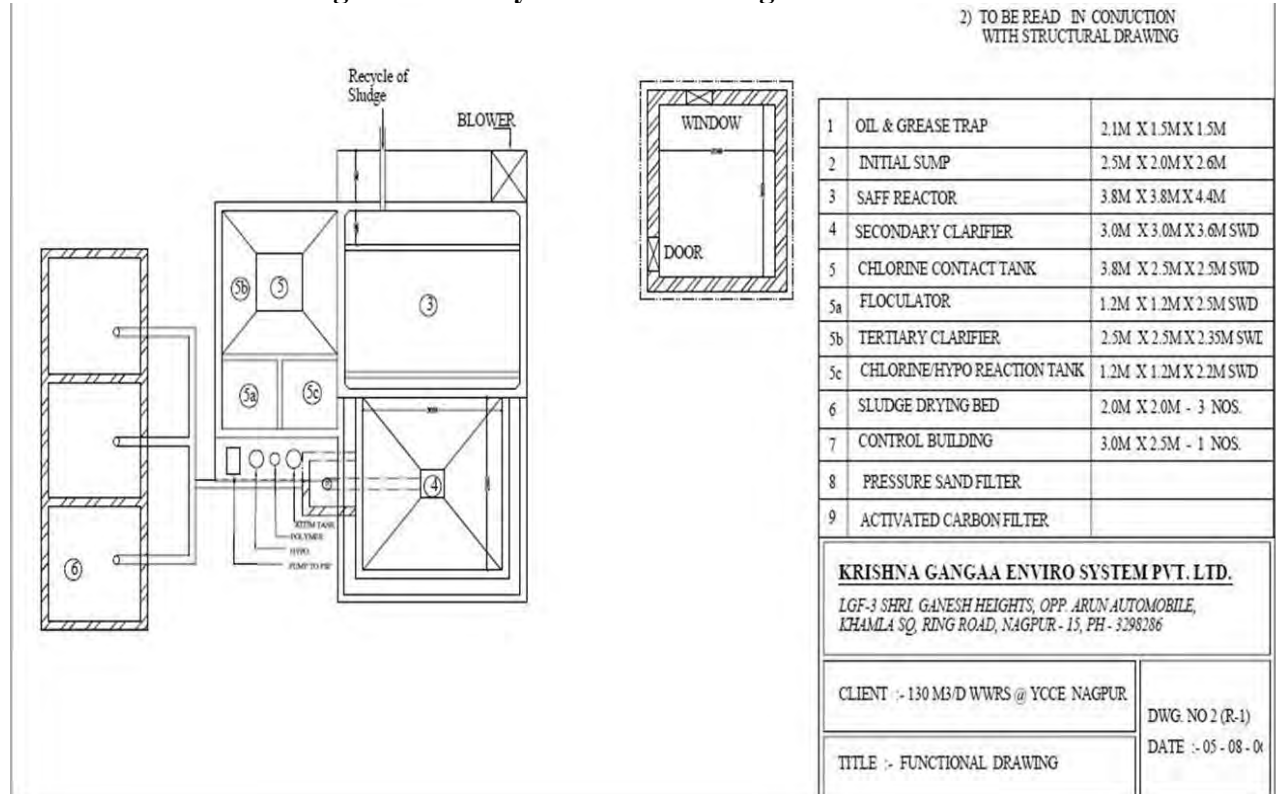


Image No. 29: Layout Plan of Sewage Treatment Plant



**Table No. 58: Sewage Standards**

Sr. No.	Parameters	Standards	
		Effluent discharge standards (applicable to all mode of disposal)	
		Location	Concentration
			not to exceed
(a)	(b)		
1)	pH	Anywhere in the country	6.5-9.0
2)	Bio-Chemical Oxygen Demand (BOD)	Metro Cities*, all State Capitals except in the State of Arunachal Pradesh, Assam, Manipur, Meghalaya	20-30
		Mizoram, Nagaland, Tripura Sikkim, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, and Union	
		territory of Andaman and Nicobar Islands, Dadar and	
		Nagar Haveli Daman and Diu and Lakshadweep	
3)	Total Suspended Solids (TSS)	Same as above [(2)-BOD]	50-100
4)	Fecal Coliform (FC) (Most Probable Number	Anywhere in the country	<1000
	per 100ml, MPN/100ml		

**Table No. 59: Qualitative and Quantitative Characteristics of Sewage at YCCE**

Sr. No.	Parameters	Unit	Result		Limit	Method Reference
			STP Inlet	STP Outlet		
1)	pH	–	7.7	8.1	–	APHA 23 <sup>rd</sup> Ed. 2017, 4500-H <sup>+</sup> - B, 4-95
2)	Total Dissolve Solids	mg/L	324	310	–	IS 3025 (Part 16): 1984 Reaffirmed 2006, Ed.2.1 (1999-12)
3)	Total Suspended Solids	mg/L	46	24	100 Max	APHA 23 <sup>rd</sup> Ed. 2017, 2500-D, 2-70
4)	Chlorides (as Cl <sup>-</sup> )	mg/L	44	48	–	APHA 23 <sup>rd</sup> Ed. 2017, 4500-

						Cl- B, 4-75
5)	Sulphates (as SO <sub>4</sub> )	mg/L	42.6	56.4	–	APHA 23 <sup>rd</sup> Ed. 2017, 4500-SO <sub>4</sub> -E,4-199
6)	Dissolved Oxygen	mg/L	4.1	6	–	APHA 23 <sup>rd</sup> Ed. 2017, 4500-O,B,4-144&C,4-146
7)	Bio-chemical Oxygen Demand	mg/L	8	5.9	100 Max	IS 3025 (Part 44): 1993, Reaffirmed 2009
8)	Chemical Oxygen demand	mg/L	41	22	–	APHA 23 <sup>rd</sup> Ed. 2017, 5220-B,5-18
9)	Oil & Grease	mg/L	Not Detected	Not Detected	–	IS 3025 (Part 39): 1991, Reaffirmed 2009, Amds.1

**Image No. 30: STP at YCCE**



**Table No. 60: Qualitative & Quantitative Parameters of Recycle Water Source at YCCE**

<b>Sr. No</b>	<b>Characteristics Parameters</b>	<b>Values</b>
1)	Odour	Agreeable
2)	Colour	<1 Hazen
3)	pH	8.10
4)	Electrical Conductivity mS/cm	0.76
5)	Water Temperature	22
6)	Relative Density	1
7)	Carbonate	Absent
8)	Bicarbonate (HCO <sub>3</sub> )	9.40
9)	Sodium (meq/L)	4.23
10)	Calcium (meq/L)	1.60
11)	Magnesium (meq/L)	4.0
12)	Potassium (meq/L)	0.01
13)	Chloride (meq/L)	48
14)	Sulphate (mg/L)	Absent
15)	Sodium Absorption Ratio (SAR)	2.52
16)	Residual Sodium Carbonate (RSC)	3.80

Image No. 31: Sample Report of Waste water testing



**QUALICHEM LABORATORIES**

"Swami Samartha Commercial Complex", 4, North Bazar Road, Gokulpath Market,  
Dharampath Extn. Nagpur-440 010. Telefax : 0712 - 2564452 Tel : 2532482  
Email : ql@qualichemlabs.com Web : www.qualichemlabs.com




Approved by Food & Drug Administration (MS) & AGMARK  
ISO/IEC 17025 Accredited Testing Laboratory by NABL vide Certificate Number TC-7067  
Recognised by Bureau of Indian Standards (BIS) & Accredited by ISO 9001:2015

Chemical & Biological Analysis of Pharmaceuticals, Food Products, Water, Effluent, Soil, Fertilizer, Coal, Mineral & Ores.

**TEST REPORT**

Name of Customer : VIVEKANAND BOYS HOSTEL  
 Address : YCC COLLEGE WANADONGRI HINGNA ROAD NAGPUR 441110 Contact No : 8668982040  
 Name of Sample & Description : STP WATER  
 Manufactured By :  
 Supplied by :  
 Customer Reference : TEF, DT. 27/10/2023  
 Date of Manufacture : Batch No :  
 Date of Expiry : Batch Size : Quantity submitted : APP. 5 LTR  
 Date of Receipt : 27-Oct-23 Start Date of Analysis : 28-Oct-23 Completion Date of Analysis : 3-Nov-23  
 Discipline : CHEM-BIO Group : POLLUTION & ENVIRONMENT  
 Description : Water with suspended matter filled in a plastic bottle.

Not sampled By Qualichem Report no : WW/86/23-24-A ULR-TC706723000003108F

No.	Test	UOM	Result
1	CHEMICAL OXYGEN DEMAND Method : IS 3025 (part 55) (L & Q : 1mg/l)	mg/l	41.2
2	BIOCHEMICAL OXYGEN DEMAND (3 days) at 27°C Method : IS 3025 (part 44) (L & Q : 1mg/l)	mg/l	14.42
-----			
Environmental Condition : Maintained as per the requirements of the samples and the test methods.			
			

**Note :** Sample submitted is analyzed as per the procedure mentioned in the test method.

Date of Report: 3 Nov 23 NLT - Not Less Than | NMT - Not More Than | B.Q.L - Below Quantification Limit  
 L.L.Q - Lower Limit of Quantification | UOM - Unit Of Measurement

- Above test result/s relate only to the sample submitted.
- Report should not be published or used in full or in part without the permission of Qualichem Laboratories.
- Any dispute arising out of this report or in connection will be subject to

*Shital Rhore*  
Shital Rhore

*Ashwini Gada*  
Ashwini Gada

Image No. 32: Sample Report of Waste water testing



FDA Licence No.  
TL22 & TL-Ayu-05

# QUALICHEM LABORATORIES

"Swami Samarth Commercial Complex" 4 North Bazar Road, Ginkupeth Market,  
Dharampeth Extn, Nagpur-440 010. Telefax: 0712-2564452 Tel: 2532482  
Email: ql@qualichemlabs.com Web: www.qualichemlabs.com



Approved by Food & Drug Administration (MS) & AGMARK  
Laboratory Accredited by ISO 9001:2015

Recognised by Bureau of Indian Standards (BIS)

Chemical & Biological Analysis of Pharmaceuticals, Food Products, Water, Effluent, Soil, Fertilizer, Coal, Mineral & Ores

## TEST REPORT

Name of Customer : VIVEKANAND BOYS HOSTEL  
 Address : YCC COLLEGE WANADONGRI HINGNA ROAD NAGPUR 441110 Contact No : 8668992040  
 Name of Sample & Description : STP WATER  
 Manufactured by : -  
 Supplied by : -  
 Customer Reference : TEF, DT. 27/10/2023  
 Date of Manufacture : - Batch No : -  
 Date of Expiry : - Batch Size : -  
 Date of receipt : 27-Oct-23 Start Date of Analysis : 28-Oct-23 Quantity submitted : APP.5 LTR  
 Discipline : CHEM-BIO Group : POLLUTION & ENVIRONMENT  
 Description : Completion Date of Analysis : 3-Nov-23

Not sampled By Qualichem

Report no. : WW/86/23-24-B

No.	Test	UOM	Result
1	DESCRIPTION Water with suspended matter filled in a plastic bottle.		-
2	DISSOLVED OXYGEN Method : IS 3025 Part 38	mg/l	2.5
3	TOTAL KJELDAHL NITROGEN Method : IS 3025 (Part 34) (L.L.Q : 0.1mg/l)	mg/L	25.75
4	TOTAL SUSPENDED SOLID Method : IS 3025 (Part 17) (L.L.Q : 1.0mg/l)	mg/l	2.0
5	TOTAL DISSOLVED SOLIDS Method : IS 3025 (Part 16)	mg/l	600.0
6	FACAL COLIFORMS Method : APHA	/100ml	Present

Date of Report : 3-Nov-23 NLT : Not Less Than | NMT : Not More Than | BQL : Below Quantification Limit  
 LLQ : Lower Limit of Quantification | UOM : Unit Of Measurement

- Above test results relate only to the sample submitted.
- Report should not be published or used in full or in part without the permission of Qualichem Laboratories.
- Any dispute arising out of this report or in connection will be subject to

*Shitar Bhore*  
Shitar Bhore

*Ashwini Gode*  
Ashwini Gode

## 15.0 Waste Audit- Sanitation Utilities

Rapid population growth, urbanisation, climate change, pollution and inadequate financing, present unprecedented challenges to the provision of water and sanitation services. Improving and managing universal services of water and sanitation in a holistic manner is critical to achieving the Sustainable Development Goals, and addressing the needs of millions of people around the world. To do so, it must take into account social, economic and environmental factors, while adapting to climate change risks to ensure the resilience of water and sanitation systems. In 2020, 54% of the global population (4.2 billion people) used a safely managed sanitation service; 34% (2.6 billion people) used private sanitation facilities connected to sewers from which wastewater was treated; 20% (1.6 billion people) used toilets or latrines where excreta were safely disposed of in situ; and 78% of the world's population (6.1 billion people) used at least a basic sanitation service.

Benefits of improved sanitation extend well beyond reducing the risk of diarrhoea. These include:

- Reducing the spread of intestinal worms, schistosomiasis and trachoma, which are neglected tropical diseases that cause suffering for millions;
- Reducing the severity and impact of malnutrition;
- Promoting dignity and boosting safety, particularly among women and girls;
- Promoting school attendance: girls' school attendance is particularly boosted by the provision of separate sanitary facilities;
- Reducing the spread of antimicrobial resistance;
- Potential recovery of water, renewable energy and nutrients from faecal waste; and
- Potential to mitigate water scarcity through safe use of wastewater for irrigation especially in areas most affected by climate change.



Table No. 61: Department-wise Provision of Sanitary Utilities

Sr. No.	Name of Department		Toilet					Washrooms		Wash Basin		Pad M/C
			Male			Female		Male	Female	Male	Female	
			WC	Seat	Urinal	WC	Seat					
1)	CSE Building	Ground Floor	0	1	3	1	0	1	1	1	1	0
		1st Floor	0	0	0	1	2	0	2	0	2	0
		2nd Floor	1	2	3	0	0	2	0	2	0	0
		3rd Floor	0	1	0	0	0	1	0	1	0	0
2)	IT Building	Ground Floor	1	0	0	3	1	1	2	1	3	1
		1st Floor	2	0	3	0	0	2	0	4	0	0
		2nd Floor	6	0	0	3	0	2	1	2	2	0
		3rd Floor	1	1	3	0	0	2	0	3	0	0
3)	Old Science Building	Ground Floor	1	2	8	0	0	3	0	3	0	0
		1st Floor	0	0	0	2	2	0	2	0	2	1
		2nd Floor	0	2	8	0	0	2	0	2	0	0
		3rd Floor	1	0	4	2	0	1	1	2	2	0
4)	Civil Building	Ground Floor	1	1	6	1	0	2	1	3	1	1
		1st Floor	0	0	0	2	0	1	1	0	0	0
		2nd Floor	0	1	6	0	0	1	0	2	2	0
		3rd Floor	0	0	0	2	1	1	1	2	0	0
5)	Mechanical Building	Ground Floor	1	2	9	0	0	3	0	2	0	0
		1st Floor	0	1	2	2	1	1	1	1	1	0
		2nd Floor	0	0	6	0	0	2	0	2	0	0
		3rd Floor	0	1	4	1	1	1	1	1	1	1
6)	Administration Building	Ground Floor	1	0	2	1	0	2	1	3	1	0
		1st Floor	5	0	2	0	2	5	1	6	2	0
		2nd Floor	2	0	1	0	2	2	1	2	1	0
		3rd Floor	2	0	3	3	0	2	2	2	2	0
7)	COE Building	Ground Floor	1	1	3	1	3	2	1	3	2	0
		1st Floor	2	0	3	1	0	2	1	3	2	0
8)	Electronics Building	Ground Floor	3	2	4	3	2	2	2	3	3	0
		1st Floor	4	2	4	3	3	3	3	2	2	1
		2nd Floor	4	2	4	3	2	2	2	3	3	0
		3rd Floor	4	3	2	3	3	3	1	4	3	0
9)	Electrical Building	Ground Floor	1	1	6	0	1	2	1	1	1	0
		1st Floor	2	1	0	2	1	1	1	2	1	1

		2nd Floor	0	2	2	1	1	1	2	1	1	0
		3rd Floor	6	1	4	1	0	1	1	1	1	0
10)	CCC Building	Ground Floor	1	0	2	2	0	1	2	1	2	0
		1st Floor	1	0	3	0	1	1	1	2	1	0
11)	Workshop 1	Ground Floor	1	0	0	0	0	1	0	1	0	0
12)	Workshop 2	Ground Floor	0	2	3	2	0	1	1	1	1	0
13)	Canteen	Ground Floor	0	1	2	0	1	1	1	1	1	0
14)	Total		55	33	115	46	30	64	39	76	47	6

**Observation & Recommendations**

Following observations were found in YCCE campus

**A- Solid waste**

- 1) Types of waste - paper, plastic, waste books, e waste etc.
- 2) Data for each type for last 3 years is required to be documented.
- 3) Paper consumption - collected at separate stores at hostel.
- 4) Reuse of paper – system is evident. Paper recycling is done by both side usage.
- 5) Garbage - segregated into wet and dry, monitored by security.
- 6) Garbage – plastic black bags are sent to dumping yard of Nagar Parishad Wanadongari.
- 7) Canteen wet garbage is given to collection system of Nagar Parishad Wanadongari.
- 8) Book recycling is evident by library.
- 9) Old magazines – from 2010 are evident.
- 10) Waste collected quantity: Average 100Kg -125Kg.
- 11) Waste segregation in various dustbins at place.
- 12) College have composting of about 200 Sq.Ft. capacity which is not in technically appropriate and sufficient

**B- E-waste**

E-waste is given to the authorized vendor of Nagar Parishad Wanadongari.

**Waste generated in YCCE:**

1. Plastic Waste: - Poly-ethylene bags and packaging, Containers, Disposables, Bottles etc.
2. Hazardous Waste: - Florescent Tubes and CFL Bulbs, Electrical waste, Laboratory Waste, etc.
3. Wooden Waste: - Damaged Furniture, Wooden Packaging
4. Metal Waste: - Scrap Metal, broken utensils, Damaged machinery from Laboratory
5. Food Waste:- Unused food from Canteen and Mess
6. Non-Biodegradable Waste: - Papers, Plastic Coated Papers,
7. Biodegradable Waste: - Tree Leaves and biomass produced in garden, uncooked vegetable remaining from Kitchen of Mess and Canteen
8. Municipal Solid Waste: - All the waste generated in gardens, collected during sweeping & Housekeeping of the College and Hostel Premises
9. Bio-Medical Waste: - Sanitary Napkins from Ladies Toilets and Ladies common rooms

10. Backup Batteries in Computer Departments and in all the departments where battery Backup is required.

11. E-Waste: - Computer and Electronics Department

**Following recommendations has suggested to YCCE.**

- 1) The solid waste generated in the collage premises to be collected in scrap Yard (Notified Area) and segregated as per the category of solid waste management and stored in the well labelled area
- 2) Plastic waste to be given to either recycler vender registered with Maharashtra State Pollution Control Board as per “The Plastics Manufacture, sale, and Usage Rules, 1999 and all its Amendments
- 3) Hazardous Waste to be disposed by identified disposal pathway within 90 days from its generation as per the guidelines of “Hazardous Waste (Management, Handling and Trans-boundary Movement) Rules 2008 with all the Amendments
- 4) To avoid wooden waste generation the furniture to be transferred from wooden to metallic in future and today’s wooden waste shall be reused in the college through carpentry shop of workshop in mechanical engineering department
- 5) Metal Waste to be reused in the college and workshop department shall be engaged for it, if they prove that the waste cannot be reused will be sale out to the venders who will recycle and reuse the same
- 6) Unused food waste to be used as cattle feed, as on today some unregistered persons take away this waste, the one who uses it shall come regularly and should be registered with the college concern department and its record shall be maintained
- 7) Non- Biodegradable waste shall be disposed to the registered vender with Maharashtra State Pollution Control Board
- 8) Biodegradable waste to be compost in the college premises in technical manner, it is observed that the vermin culture pans are present in the college but in technical institute it is expected that the composting shall be done in perfect technical manner
- 9) Municipal Solid Waste to be disposed as per the guidelines “The Municipal Solid Wastes (Management and Handling) Rules, 2000 with its all Amendments

10) Bio- Medical Waste is generated in very large amount and this waste to be disposed within 48 hours from the generation as per the guidelines of “The Bio-Medical Waste (Management and Handling) Rules 1998 and its all Amendments

11) The replaced or used batteries which could not be recharge as the life get exhausted shall be disposed as per the guidelines of “The Batteries (Management and Handling) Rules, 2001 and all its Amendments

12) The E-Waste Produced in the collage to be disposed off as per the guidelines in “E-Waste Management and Handling Rules, 2011 and all its Amendments.

13) The records of proper disposal of all the solid wastes to be maintained with its manifests at one central place.

## 16.0 Fire and Safety Audit

Fire safety is the set of practices intended to reduce the destruction caused by fire. Fire safety measures include those that are intended to prevent the ignition of an uncontrolled fire and those that are used to limit the development and effects of a fire after it starts. Fire safety measures include those that are planned during the construction of a building or implemented in structures that are already standing, and those that are taught to occupants of the building. Threats to fire safety are commonly referred to as fire hazards. A fire hazard may include a situation that increases the likelihood of a fire or may impede escape in the event a fire occurs. Fire safety is often a component of building safety. Those who inspect buildings for violations of the Fire Code and go into schools to educate children on fire safety topics are fire department members known as Fire Prevention Officers. The Chief Fire Prevention Officer or Chief of Fire Prevention will normally train newcomers to the Fire Prevention Division and may also conduct inspections or make presentations.

**Table No. 62: Building-wise Availability of Fire Safety Systems**

<b>Sr. No.</b>	<b>Buildings / Unit</b>	<b>Fire System Availability</b>
1)	CCC Building	Fire Hydrant, Fire Auto Detection, Fire Alarm, Fire Extinguishers
2)	Admin Building	Fire Hydrant, Fire Alarm, Fire Extinguishers
3)	Electronics Building	Fire Hydrant, Fire Alarm, Fire Extinguishers
4)	Exam Control Building	Fire Hydrant, Fire Auto Detection, Fire Alarm, Fire Extinguishers
5)	IT Building	Fire Hydrant, Fire Alarm, Fire Extinguishers
6)	Mech Workshop	Fire Hydrant, Fire Alarm, Fire Extinguishers
7)	Science Building	Fire Hydrant, Fire Alarm, Fire Extinguishers
8)	Civil Building	Fire Hydrant, Fire Alarm, Fire Extinguishers
9)	Civil lab Shed	Fire Hydrant, Fire Extinguishers
10)	Mechanical Building	Fire Hydrant, Fire Alarm, Fire Extinguishers
11)	Mechanical Lab	Fire Hydrant, Fire Alarm, Fire Extinguishers
12)	Electrical & Computer Building	Fire Hydrant, Fire Alarm, Fire Extinguishers

Image No. 33: Fire system at YCCE

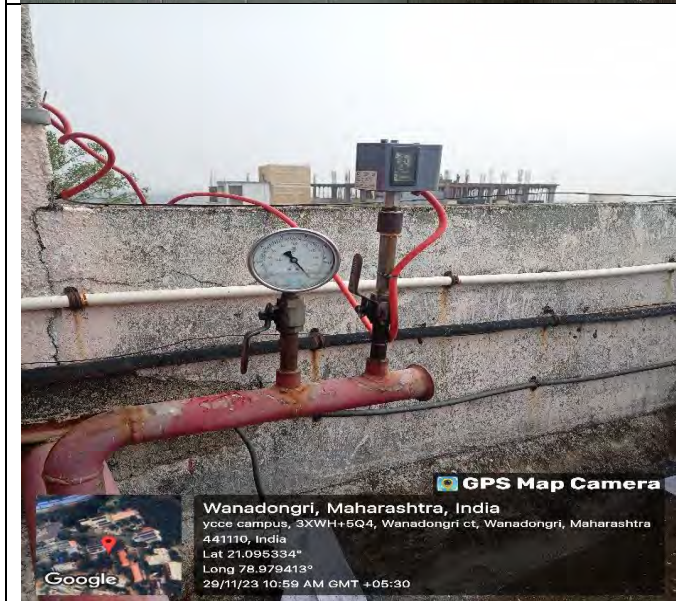
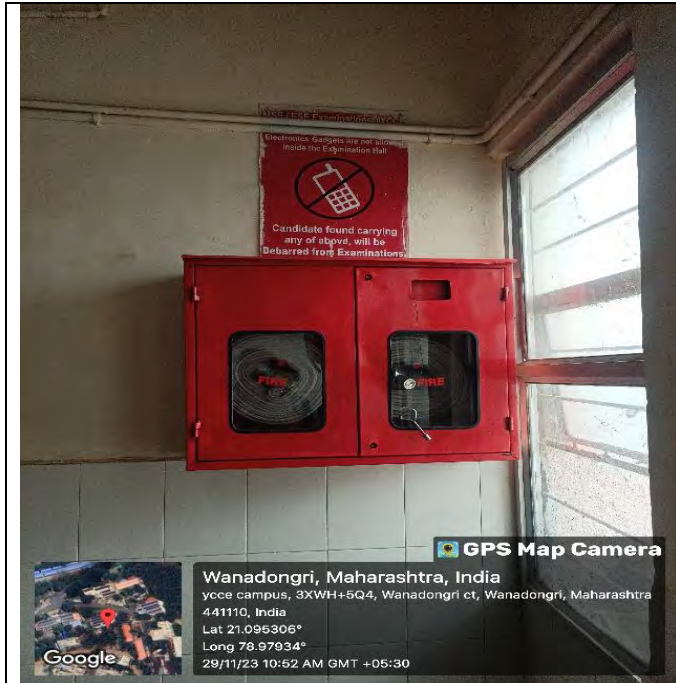


Table No. 63: Fire Safety Details of CCC Building

Name of Building & Nos. of floor		YCCE-CCC Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		1082.67				
Height of Building (In Mtr.)		9.9				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)		Fire NOC Next Renewal Date:-NA		
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	5000 Ltr.	Yes	Ok
		Underground water tank (only Sprinkler system)	Yes	20000 Ltr.	NA	Ok
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	Yes	7.5 HP	Yes	Working & Oiling greasing
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	No	NA	NA	NA
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	3 Nos.	Yes	Working & Oiling greasing
		Hose Reel	Yes	2 Nos.	Yes	Working
Hose Box	Yes	3 Nos.	Yes	Present		



		Sprinklers	No	No	No	NA
		RRL Hose Pipe	Yes	06 Nos.	Yes	Present in hose Box
		Branch pipe	Yes	03 Nos.	Yes	Present in hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	Yes	NA	Yes	Working
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	2 Nos.	Yes	Working
		Sounder	Yes	2 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	6 Nos.	Yes	Working
		Co2type	Yes	05 Nos.	Yes	Ok(Due18/09/2024&(02/10/2024)
		Foam type	No	NA	NA	NA
		Water type	No	NA	NA	NA
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok

Table No. 64: Fire Safety Details of Admin Building

Name of Building & Nos. of floor		YCCE- Admin Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		3574.02				
Height of Building (In Mtr.)		11.4				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	15000 Ltr.	Yes	Ok
		Underground water tank (only Sprinkler system)	Yes	20000 Ltr.	Yes	Ok
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes			DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	Yes	15 HP	Yes	Working, Oiling & greasing
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	No	NA	NA	NA
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	5 Nos.	Yes	Working, Oiling & greasing
	Hose Reel	Yes	4 Nos.	Yes	Working	

		Hose Box	Yes	5 Nos.	Yes	Present
		Sprinklers	No		No	NA
		RRL Hose Pipe	Yes	10 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	05 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	12 Nos.	Yes	Ok
		Sounder	Yes	12 Nos.	Yes	Ok
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	16 Nos.	Yes	Ok(Due 18/09/2024)&(02/10/2024)
		Co2 type	Yes	5 Nos.	Yes	
		Foam type	Yes	1 Nos.	Yes	
		Water type	NA	NA	NA	
6	Fire Bucket		NA	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok

Table No. 65: Fire Safety Details of Electronics Building

Name of Building & Nos. of floor		YCCE- Electronics Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		6763.78				
Height of Building (In Mtr.)		12.3				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	1000 Ltr.	Yes	Ok
		Underground water tank (only Sprinkler system)	No	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	7.5 HP	Yes	Working
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	4 Nos.	Yes	Working, Oiling & greasing
		Hose Reel	Yes	3 Nos.	Yes	Working
		Hose Box	Yes	4 Nos.	Yes	Present
		Sprinklers	No	NA	No	NA
RRL Hose Pipe	Yes	4 Nos.	Yes	Present in Hose Box		

		Branch pipe	Yes	04 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	4 Nos.	Yes	Working
		Sounder	Yes	4 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	27 Nos.	Yes	Ok (Due 18/09/2024) & (02/10/2024)
		Co2 type	Yes	03 Nos.	Yes	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes	NA	Yes	Ok

Table No. 66: Fire Safety Details of Exam Control Building

Name of Building & Nos. of floor		YCCE- Exam Control Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		625.19				
Height of Building (In Mtr.)		7.6				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	20000 Ltr.	Yes	Working
		Underground water tank (only Sprinkler system)	No	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	10 HP	Yes	Working
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	5 Nos.	Yes	Working
		Hose Reel	Yes	4 Nos.	Yes	Working
		Hose Box	Yes	5 Nos.	Yes	Present
		Sprinklers	No	NA	No	NA
		RRL Hose Pipe	Yes	10 Nos.	Yes	Present in Hose Box
Branch pipe	Yes	5 Nos.	Yes	Present in Hose Box		

		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	Yes	NA	Yes	Working
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	4 Nos.	Yes	Working
		Sounder	Yes	4 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	3 Nos.	Yes	Ok (Due 18/09/2024) & (02/10/2023)
		Co2type	Yes	4 Nos.	Yes	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes	NA	Yes	Ok

Table No. 67: Fire Safety Details of IT Building

Name of Building & Nos. of floor		YCCE- IT Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		2913.64				
Height of Building (In Mtr.)		14.9				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	20000 Ltr.	Yes	Ok
		Underground water tank (only Sprinkler system)	No	No	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	No	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	No	NA	NA
		Sprinkler pump	No	No	NA	NA
		Diesel pump	No	No	NA	NA
		Jockey pump	No	No	NA	NA
		Booster pump	Yes	7.5 HP	Yes	Working, Oiling & greasing
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	4 Nos.	Yes	Working, Oiling & greasing
		Hose Reel	Yes	3 Nos.	Yes	Working
		Hose Box	Yes	4 Nos.	Yes	present
Sprinklers	No	No	No	NA		



		RRL Hose Pipe	Yes	08 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	04 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	No	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	No	NA	NA
		Heat Detector	No	No	NA	NA
		Manual call Point (MCP)	Yes	4 Nos.	Yes	Working
		Sounder	Yes	4 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	12 Nos.	Yes	Ok (Due 18/09/24)&(02/10/2024)
		Co2type	Yes	4 Nos.	Yes	
		Foam type	No	NA	NA	
		Water type	No	No	NA	
6	Fire Bucket		No	No	NA	NA
7	Evacuation Plan & Signages		Yes	No	Yes	Ok

Table No. 68: Fire Safety Details of Mechanical Workshop Building

Name of Building & Nos. of floor		YCCE- Mechanical Workshop Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		1403.55				
Height of Building (In Mtr.)		5.25				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	20000 ltr	Yes	oK
		Underground water tank (only Sprinkler system)	No	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes		Yes	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	7.5 HP	Yes	Working
		Fire pump Panel	Yes	1 Nos	Yes	Working
		Hydrant valve	Yes	02 Nos	Yes	Working
		Hose Reel	Yes	2Nos	Yes	Working
		Hose Box	Yes	2 Nos	Yes	Present
		Sprinklers	No	NA	NA	NA
RRL Hose Pipe	Yes	4	Yes	Present in Hose Box		
Branch pipe	Yes	2 Nos	Yes	Present in Hose Box		

		Two Way	Yes	1 Nos	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	03 Nos	Yes	Working
		Sounder	Yes	03 Nos	Yes	Working
		Fire Alarm Panel	No	NA	NA	Working
5	Fire Extinguisher	ABC type	Yes	11 Nos.	Yes	Ok (Due 18/09/24)&(02/10/2024)
		Co2type	Yes	01 Nos.	Yes	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok

Table No. 69: Fire Safety Details of Old Science Building

Name of Building & Nos. of floor		YCCE- Old Science Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		2594.608				
Height of Building (In Mtr.)		10.95				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	10000 Ltr.	Yes	Ok
		Underground water tank (only Sprinkler system)	No	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	11/15 HP	Yes	Working, Oiling & greasing
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	4 Nos.	Yes	Working, Oiling & greasing
		Hose Reel	Yes	3 Nos.	Yes	Working
		Hose Box	Yes	4 Nos.	Yes	Present
Sprinklers	No	No	No	NA		

		RRL Hose Pipe	Yes	08 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	03 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	4 Nos.	Yes	Working
		Sounder	Yes	4 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	12 Nos.	Yes	Ok(Due 18/09/24)&(02/10/2024)
		Co2type	Yes	02 Nos.	Yes	
		Foam type	Yes	1 Nos.	Yes	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok

Table No. 70: Fire Safety Details of Civil Engg. Building

Name of Building & Nos. of floor		YCCE- Civil Engg. Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		2679.83				
Height of Building (In Mtr.)		14.9				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	5000 Ltr.	NA	Ok
		Underground water tank (only Sprinkler system)	Yes	15000 Ltr.	Yes	Ok
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	15 HP	Yes	Working, Oiling & greasing
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	5 Nos.	Yes	Working, Oiling & greasing
		Hose Reel	Yes	4 Nos.	Yes	Working
		Hose Box	Yes	5 Nos.	Yes	Present
Sprinklers	No	No	No	NA		

		RRL Hose Pipe	Yes	10 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	04 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	4 Nos.	Yes	Working
		Sounder	Yes	4 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	16 Nos.	Yes	Ok (Due 18/09/24)&(02/10/2024)
		Co2type	Yes	02 Nos.	Yes	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes	NA	Yes	Ok

Table No. 71: Fire Safety Details of Civil Lab Shed

Name of Building & Nos. of floor		YCCE- Civil Lab Shed. Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		513.86				
Height of Building (In Mtr.)		3.97				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)		Fire NOC Next Renewal Date:-NA		
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	No	NA	NA	NA
		Underground water tank (only Sprinkler system)	No	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	No	NA	NA	NA
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	No	NA	NA	NA
		Fire pump Panel	No	NA	NA	Working, Oiling & greasing
		Hydrant valve	Yes	1 Nos.	Yes	Working, Oiling & greasing
		Hose Reel	Yes	1 Nos.	Yes	Present
		Hose Box	Yes	1 Nos.	Yes	NA
Sprinklers	No	NA	NA	NA		



		RRL Hose Pipe	Yes	2 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	1 Nos.	Yes	Present in Hose Box
		Two Way	No	NA	NA	NA
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	No	NA	NA	NA
		Sounder	No	NA	NA	NA
		Fire Alarm Panel	No	NA	NA	NA
5	Fire Extinguisher	ABC type	Yes	4 Nos.	Yes	Ok (Due 18/09/24) & (02/10/2024)
		Co2 type	No	NA	NA	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		Yes	8	Yes	Ok Filled with Sand
7	Evacuation Plan & Signages		Yes	Yes	Present	Ok

Table No. 72: Fire Safety Details of Mechanical Engg Building

Name of Building & Nos. of floor		YCCE- Mechanical Engg Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		2413.03				
Height of Building (In Mtr.)		14.9				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	10000 Ltr.	Yes	Ok
		Underground water tank (only Sprinkler system)	No	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	15 HP	Yes	Working, Oiling & greasing
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	5 Nos.	Yes	Working, Oiling & greasing
		Hose Reel	Yes	4 Nos.	Yes	Working
		Hose Box	Yes	5 Nos.	Yes	Present
Sprinklers	No	No	No	NA		

		RRL Hose Pipe	Yes	10 Nos.	Yes	Present
		Branch pipe	Yes	05 Nos.	Yes	Present
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	NA	NA	NA
		Heat Detector	No	NA	NA	NA
		Manual call Point (MCP)	Yes	4 Nos.	Yes	Working
		Sounder	Yes	4 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	12 Nos.	Yes	Ok (Due 18/09/24)&(02/10/2024)
		Co2type	Yes	2Nos	Yes	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok

Table No. 73: Fire Safety Details of Mechanical Lab. Building

Name of Building & Nos. of floor		YCCE- Mechanical Lab Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		1253.71				
Height of Building (In Mtr.)		5.25				
Whether Fire Fighting System Installed(Yes/No)		Yes				
Fire NOC Received (Yes / No )		Yes(Provisional)		Fire NOC Next Renewal Date:-NA		
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	No	NA	NA	NA
		Underground water tank (only Sprinkler system)	Yes	20000 Ltr.	Yes	Working
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	No	NA	NA	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA
		Sprinkler pump	No	NA	NA	NA
		Diesel pump	No	NA	NA	NA
		Jockey pump	No	NA	NA	NA
		Booster pump	Yes	7.5/10 HP	Yes	Working
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	3 Nos.	Yes	Working
		Hose Reel	Yes	3 Nos.	Yes	Working
		Hose Box	Yes	3 Nos.	Yes	Present
Sprinklers	No	No	No	NA		

		RRL Hose Pipe	Yes	6 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	3 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	No	No	NA
		Heat Detector	No	No	No	NA
		Manual call Point (MCP)	Yes	3 Nos.	Yes	Working
		Sounder	Yes	3 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	07 Nos.	Yes	Ok (Due 18/09/24) & (02/10/2024)
		Co2 type	Yes	1 Nos.	Yes	
		Foam type	Yes	01 Nos.	Yes	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok

Table No. 74: Fire Safety Details of Electrical Engg. Building

Name of Building & Nos. of floor		YCCE- Electrical Engg Building			Date:-29-11-2023		
Address		YCCE Wanadongri, Nagpur					
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer					
Area of Building (In Sq. Mtr.)		5239.05					
Height of Building (In Mtr.)		14.7					
Whether Fire Fighting System Installed(Yes/No)		Yes					
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA		
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks	
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	10000 Ltr.	Yes	Ok	
		Underground water tank (only Sprinkler system)	Yes	20000 Ltr.	Yes	Ok	
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes	NA	NA	DG Supply Connected	
3	Fire Hydrant & Sprinkler System	Hydrant pump	No	NA	NA	NA	
		Sprinkler pump	No	NA	NA	NA	
		Diesel pump	No	NA	NA	NA	
		Jockey pump	No	NA	NA	NA	
		Booster pump	Yes	15 HP	Yes	Working, Oiling & greasing	
		Fire pump Panel	Yes	1 Nos.	Yes	Working	
		Hydrant valve	Yes	7 Nos.	Yes	Working, Oiling & greasing	
		Hose Reel	Yes	6 Nos.	Yes	Working	
		Hose Box	Yes	7 Nos.	Yes	Present	
Sprinklers	No	No	No	NA			

		RRL Hose Pipe	Yes	14N0S	Yes	Present in Hose Box
		Branch pipe	Yes	7 Nos.	Yes	Present in Hose Box
		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	No	No	No	NA
		Heat Detector	No	No	No	NA
		Manual call Point (MCP)	Yes	8 Nos.	Yes	Working
		Sounder	Yes	8 Nos.	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	19 Nos.	Yes	Ok (Due 18/09/24)&(02/10/2024)
		Co2type	Yes	05 Nos.	Yes	
		Foam type	No	NA	NA	
		Water type	No	NA	NA	
6	Fire Bucket		No	NA	NA	NA
7	Evacuation Plan & Signages		Yes	NA	Yes	

Table No. 75: Fire Safety Details of CSE Building

Name of Building & Nos. of floor		YCCE- CSE Building			Date:-29-11-2023	
Address		YCCE Wanadongri, Nagpur				
Building In-charge (Name & Designation)		Chetan Wazalwar-Admin Officer				
Area of Building (In Sq. Mtr.)		2215.28				
Height of Building (In Mtr.)		15				
Whether Fire Fighting System Installed(Yes/No)		NO				
Fire NOC Received (Yes / No )		Yes(Provisional)			Fire NOC Next Renewal Date:-NA	
Sr. No	Description	Specification/ Details	Availability (Yes /No)	Capacity /Quantity/No's	Status as on date About the Working	Remarks
1	Water Storage Tank	Overhead water tank (only hydrant system)	Yes	20000 Ltr.	Yes	Working
		Underground water tank (only Sprinkler system)	NA	NA	NA	NA
2	Electrical Back Up	Whether Electric Backup Available or Not in Term of DG Set	Yes		Yes	DG Supply Connected
3	Fire Hydrant & Sprinkler System	Hydrant pump	NA	NA	NA	NA
		Sprinkler pump	NA	NA	NA	NA
		Diesel pump	NA	NA	NA	NA
		Jockey pump	NA	NA	NA	NA
		Booster pump	Yes	10 HP	Yes	Working
		Fire pump Panel	Yes	1 Nos.	Yes	Working
		Hydrant valve	Yes	8	Yes	Working
		Hose Reel	Yes	8	Yes	Working
		Hose Box	Yes	8	Yes	Present
		Sprinklers	NA	NA	NA	NA
		RRL Hose Pipe	Yes	16	NA	Present in Hose Box
Branch pipe	NA	NA	NA	Present in Hose Box		



		Two Way	Yes	1 Nos.	Yes	Working
		Four Way	NA	NA	NA	NA
4	Fire Detection & Alarm system	Smoke Detector	NA	NA	NA	NA
		Heat Detector	NA	NA	NA	NA
		Manual call Point (MCP)	Yes	8	Yes	Working
		Sounder	Yes	8	Yes	Working
		Fire Alarm Panel	Yes	1 Nos.	Yes	Working
5	Fire Extinguisher	ABC type	Yes	08 Nos.	Yes	Refilling Date- 19/09/2024 & 02/10/24
		Co2type	Yes	03 Nos.	Yes	
		Foam type	NA	NA	NA	
		Water type	NA	NA	NA	
6	Fire Bucket		NA	NA	NA	NA
7	Evacuation Plan & Signages		Yes		Yes	Ok.

### **Observation & Recommendations**

Conducting a fire audit is crucial for ensuring the safety of people and property. Here are some recommendations for a fire audit:

- 1) Ensure compliance with building codes, fire prevention laws, and industry standards.
- 2) Ensure that employees are familiar with evacuation procedures and emergency exits.
- 3) Ensure that fire extinguishers are regularly inspected, maintained, and properly charged.
- 4) Ensure that storage areas are well-ventilated and have adequate fire protection.
- 5) Checking of availability and condition of first aid kits and fire safety equipment.
- 6) Consider external factors such as the proximity of fire hydrants, accessibility for fire trucks, and the availability of water sources.

## 17.0 Green Initiatives/ Activities in Campus

### 1. Feedofest

On the occasion of World Environment Day, NSS unit of YCCE has organized Feedofest 2.0 - Avio-fest. Under this event, volunteers had taken initiative to feed and to take care of the stray animals and birds living nearby them even in the prevailing situation. This is not only to protect those creatures but also to encourage volunteers to spread a word of love and awareness towards them.



## 2. Tree Plantation Drive

NSS unit of YCCE under Unnat Bharat Abhiyan organized Tree plantation Drive every year. The main purpose of drive was to make people aware of the importance of trees, their need and encourage them to plant more trees and take proper care of their growth. The Drive was initiated from Raipur village followed by Degma Budruk Village and Degma khurd Village. The Drive was inaugurated by planting a sapling by the hands of Sarpanch of villages along with the faculties of YCCE. NSS unit of YCCE successfully planted over 100 saplings. The event was a grand success with appreciation from Villagers and Sarpanch of the village. Core committee thanked all the volunteers for their active participation and dedication they showed for the event.





### 3. Cleanliness Drive

The Cleanliness Drive was successfully organized by NSS unit of YCCE at Variety Square, Sitabuldi, Nagpur. The main purpose of drive was to clean the surrounding area which brings the occurrence of diseases and to raise awareness on the importance of cleanliness in one's surrounding. NSS unit of YCCE has collected over 80kg garbage in the presence of faculties along with 100+ volunteers.



## 18.0 Overall Recommendations

- 1) Lab waste water quantity and quality should be measured and drained to treatment system.
- 2) Solid waste segregation is not done before final disposal.
- 3) Green chemistry methods- Like solvent extraction are to be practiced.
- 4) Calibration of instrument in lab to be done regularly.
- 5) Composting of bio degradable waste to be done by Aerobic or Anaerobic digestion process.
- 6) Plan for green belt development to be prepared.
- 7) Rain water Harvesting (RWH) is to be implement at all buildings in campus.
- 8) Department wise electrical load consumption is to be done yearly.
- 9) Awareness for energy and water conservation among students and staff by displaying boards.
- 10) Water usage reduction techniques to be used like automation or sensor-based appliances.
- 11) Proper method for disposal of sanitary napkins to be adopt as per the Biomedical waste disposal Act.
- 19) Tree plantation shall be done to maintain biodiversity as well as artificial nesting shall be installed.
- 20) D. G. stack monitoring/Exhaust gas analysis shall be done.
- 21) Awareness sessions to be organized for students and staff about green environment.