

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)

Year 2023 to 2024



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

Certificate

This is to certify that an “**Environmental Audit**” for Yeshwantrao Chavan College of Engineering, Nagpur has been conducted for the period of **January 2023 to December 2024** 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 & Safety, Land use Land cover and the Eco-friendly initiatives implemented within the college campus.

Place: Nagpur

Date: 20/11/2024



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

Certificate of Achievement

Harshal Warade

has successfully passed all the course assessment requirements.

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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

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1.0 Introduction

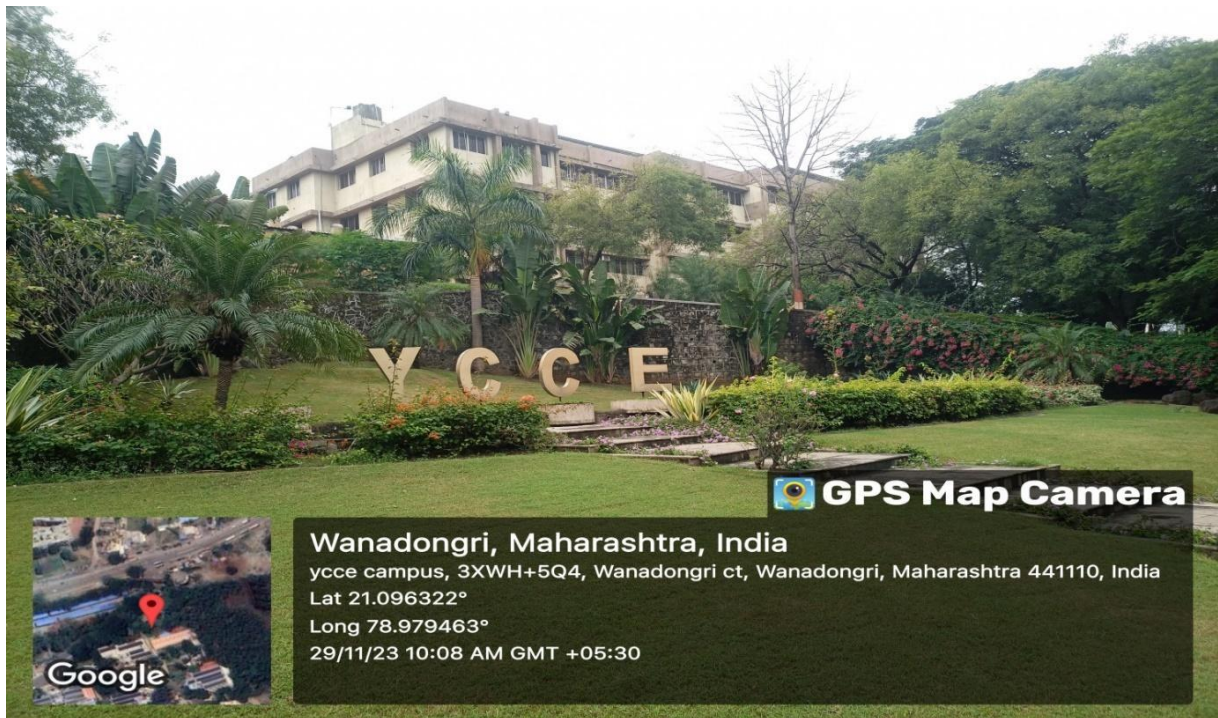
Yeshwantrao Chavan College of Engineering (YCCE), established in 1984 by the Nagar Yuwak Shikshan Sanstha, Nagpur, is a premier institution recognized for its excellence in engineering education and research. Over the past 39 years, YCCE has consistently nurtured and inspired aspiring engineers from across the country, earning its place as one of Maharashtra's top choices for engineering studies. Guided by an esteemed Academic Advisory Board comprising distinguished academicians from renowned technical institutes in India, YCCE is dedicated to producing skilled, knowledgeable, and innovative engineers who contribute to the advancement of both the industry and the nation. The institution holds the distinction of being the first private engineering college in Central India to be granted "Autonomous Status." With an increasing reputation, YCCE is now a highly sought-after destination for students aiming to pursue higher education in technology and secure placements in competitive sectors like software and core industries. The college places a strong emphasis on providing a robust professional education that shapes ambitious engineers into future leaders in their respective fields. The faculty members, highly qualified and experienced, are committed to delivering top-tier education that fosters the development of exemplary engineers.

The college's state-of-the-art infrastructure and conducive learning environment further enhance the teaching and learning experience, which cultivates student engagement and academic excellence. These combined factors have solidified YCCE's position as the most preferred engineering college in Nagpur. Recently, the college received reaccreditation with an 'A++' grade and a CGPA of 3.6 from the National Assessment and Accreditation Council (NAAC), valid from May 2022 to May 2027. Additionally, the University Grants Commission (UGC) has extended the college's Autonomous Status for another ten years, from 2022-23 to 2031-32. All departments at YCCE are approved research centers by Rashtrasant Tukadoji Maharaj Nagpur University. The college boasts 152 Ph.D. graduates and currently has 82 Ph.D. students enrolled across various disciplines. Faculty members have published 102 patents, with 100 national and international patents granted. In the 2022-23 National Institutional Ranking Framework (NIRF), YCCE ranked among the top 300 institutions in India, alongside IITs, NITs, government engineering colleges, and autonomous institutions. The college has also established prestigious Centres of Excellence, including Siemens Centre for Digital Manufacturing Robotics, AVEVA Centre for Excellence, and NVIDIA Centre for Artificial Intelligence and Machine Learning. Furthermore, YCCE was selected by the Ministry of Micro, Small, and Medium Enterprises, Government of India, as a Technical Business Incubator under the ASPIRE scheme, leading to the registration of 10 startups.

Image No. 1: Map of YCCE Campus



Image No. 2: Green Campus of YCCE



The infrastructure and environment of the institute are fully designed to enhance the teaching-learning process, fostering student engagement and attention towards their studies. These factors have positioned YCCE as the most preferred and ideal engineering college in Central India. The institute has been awarded an 'A++' grade by the National Assessment and Accreditation Council (NAAC) for the period 2022-2027. Located at a latitude of 21.096742 and a longitude of 78.979402, Yeshwantrao Chavan College of Engineering, Nagpur, is situated just 14.7 km from both Nagpur Airport and Railway Station, along the Nagpur-Hingna road. The college campus, nestled on a lush green hilltop, was once barren land 39 years ago. Its elevated position offers a respite from the pollution of nearby streets, contributing to cleaner air within the college premises.

1.1 Institute Details

Detail Address of the Institute

Yeshwantrao Chavan College of Engineering 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

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

MEGHE GROUP OF INSTITUTIONS	
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 Institute is guided by an esteemed Academic Advisory Board comprising distinguished academicians from renowned technical institutions in India and the USA. It is supported by a team of highly qualified and experienced senior faculty members.

Yeshwantrao Chavan College of Engineering (YCCE) is renowned for its excellence in engineering education and research. For over 36 years, it has successfully nurtured young engineering professionals, establishing itself as a premier destination for students seeking advanced technical education and placement in competitive software and core industries. The college offers a unique blend of respected scholars, an international presence, and interdisciplinary studies. As a prestigious institution, YCCE was selected as one of the few well-performing colleges for the Government of India's Technical Education Quality Improvement Program (TEQIP Phase I), funded by the World Bank. With this financial support, the college has developed state-of-the-art infrastructure, laboratories, computational facilities, and a comprehensive library. YCCE holds the distinction of being the first private engineering college in Central India to be granted 'Autonomous' status. The first cohort of students under this status began their B.E. and M.Tech. courses in the academic session 2010-2011. In 2021-22, a UGC peer team visited the college and granted an 'Extension of Autonomy' for 10 years (2022-23 to 2031-32). The college maintains a strong focus on quality assurance through continuous Accreditation and Re-Accreditation of both UG and PG programs by the National Board of Accreditation (NBA), New Delhi, since 2003. The B.Tech. programs in Civil Engineering, Electronics & Telecommunication Engineering, and Electronics Engineering are accredited for six years, from 2023-24 to 2028-29, while the B.Tech. programs in Mechanical Engineering and Electrical Engineering are accredited for three years, from 2023-24 to 2025-26, by NBA. M.Tech. programs in Structural Engineering, Integrated Power System, and CAD-CAM were accredited by NBA until June 2019. The institute also holds an 'A++' grade from the UGC National Assessment and Accreditation Council (NAAC), Bangalore. In 2014, it received the ISTE National Award for being the "Best Private Engineering College" in the country.

YCCE has consistently ranked highly in various national rankings: 32nd All India Rank, 23rd among self-financing institutions, and 4th in the West Zone by Data Quest-CMR Ranking 2020; 134th All India Rank among IITs, NITs, Government, and Autonomous Engineering Institutions by NIRF (MHRD, Govt. of India) in 2019; and Top 150 Engineering Institutions in India in 2017 and 2018. It also secured the 93rd All India Rank among IITs, NITs, Government, and Autonomous Institutions in 2016. Additionally, it won second prize for its magazine in 2019-20 from RTMNU, Nagpur, and was awarded an 'A' grade by the Government of Maharashtra in 2002-2003.

All technical departments at YCCE are recognized as centers for higher learning and research by RTM Nagpur University, with approximately 82 Ph.D. scholars currently enrolled and 152 candidates having been awarded Ph.D. degrees. In the last five years, the institution has received financial assistance of ₹5.5 Crores from various funding agencies like AICTE, DST, UGC, and more. The Innovation Gallery showcases outstanding UG/PG student projects, and the institute supports MSME technology business incubators under the ASPIRE scheme to promote innovation, rural industries, and entrepreneurship. YCCE is also a Nodal Centre for the "Smart India Hackathon," an initiative by MHRD, Govt. of India.

Furthermore, the college enjoys continuous accreditation from major corporates and industries like TCS, Capgemini, Wipro, which significantly enhances students' placement and internship opportunities.

1.2.1 Visionary

Hon'ble Shri Dattaji Meghe is the visionary founder of Nagar Yuwak Shikshan Santha, Nagpur, and has been a guiding force in spreading the light of education. His relentless "can-do-more" attitude sparked an intellectual revolution that has transformed the social, educational, economic, and cultural landscape of rural Maharashtra. Driven by his deep commitment to social upliftment, Shri Dattaji Meghe made a modest beginning 36 years ago by establishing a small educational institute, which has since grown into an educational empire with a vast network of institutions across Maharashtra. Under the leadership of the Society, 27 institutions have been established, offering a wide range of educational programs from pre-primary to postgraduate levels, covering diverse fields such as Medical Sciences, Pharmacy, Engineering, Social Sciences, Commerce, Science, Physical Education, and Performing Arts. This educational family serves nearly 30,000 students and is supported by a dedicated team of around 1,500 highly skilled staff members. Shri Dattaji Meghe emphasizes the importance of quality education, discipline, and the welfare of both students and staff. At YCCE, we remain steadfast in our mission to be a leader in delivering quality engineering education. The institute is also committed to advancing knowledge and skills in the professional world through scientific inquiry, applied research, and innovation, contributing significantly to socio-economic progress. The management and faculty are fully dedicated to fostering excellence in academics and guiding students to realize their full potential in all aspects of their personal and professional development.

1.2.2 Leadership

Shri Sagar Meghe and Shri Sameer Meghe, empowered by knowledge and driven by a legacy of achievement, have elevated YCCE to new heights through their focused expertise, visionary leadership, and deep commitment to humanity. Their contributions have fostered the development of students, scholars, and technocrats who, in turn, make meaningful contributions

to society and the profession. Under their inspiring leadership, YCCE students not only grasp the intricacies of engineering sciences in classrooms and laboratories but also apply their knowledge innovatively in real-world engineering applications.

Vision of the Institute

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

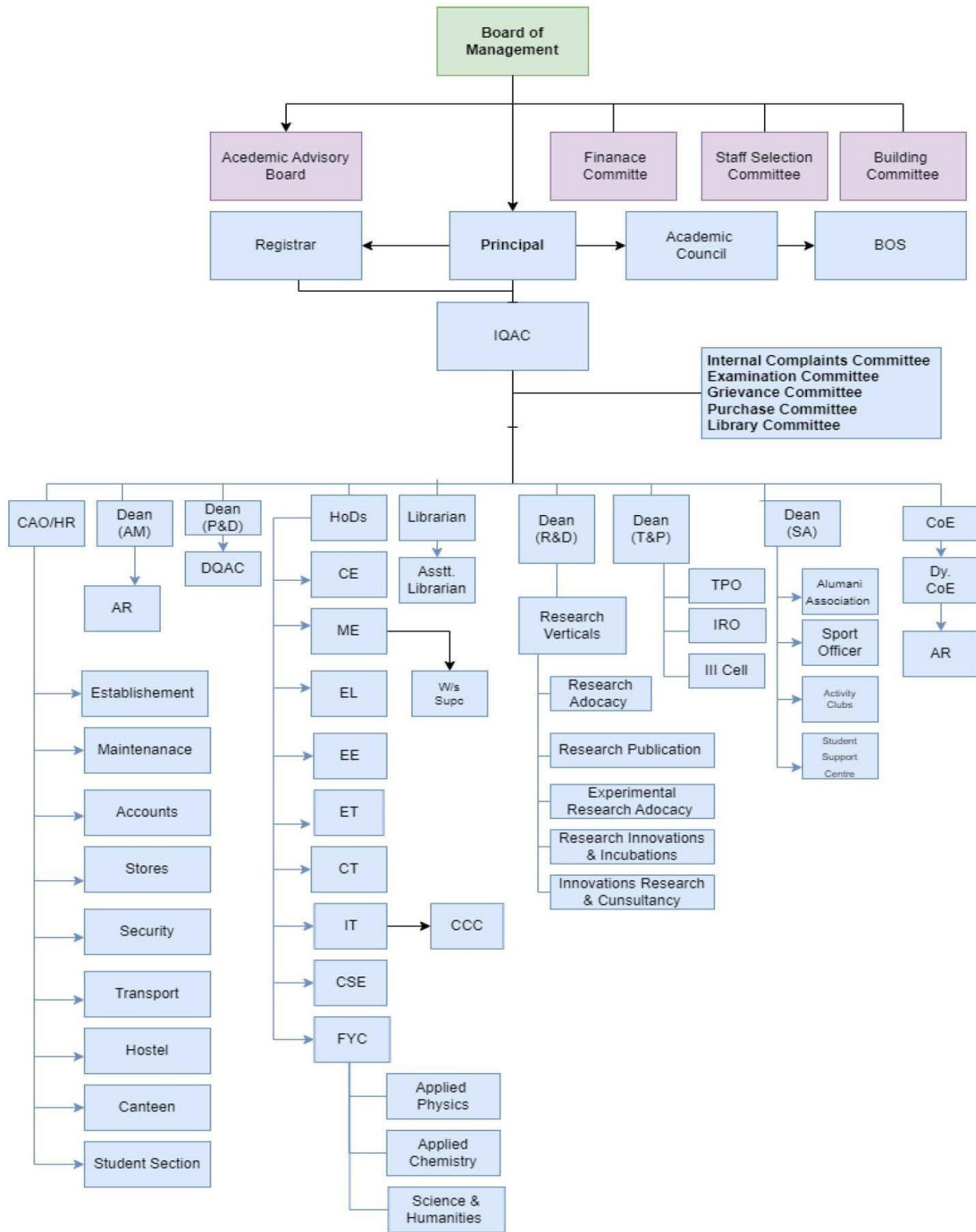
Mission of the Institute

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 audits were introduced in the 1970s with the objective of evaluating the activities of organizations whose operations may pose risks to human health and the environment. These audits help verify the credibility of claims made by multinational corporations, military establishments, and national governments regarding health concerns arising from environmental pollution. Organizations are responsible for conducting Green Audits to ensure compliance with relevant regulations, enhance operational efficiency, assess potential liabilities, and identify cost-saving opportunities that contribute to revenue generation. By conducting a Green Audit, organizations gain insights into improving environmental conditions, and several factors have contributed to its increasing adoption. Green Audit is linked to Criterion 7 of the National Assessment and Accreditation Council (NAAC), an autonomous body in India that assigns accreditation grades (A, B, or C) to institutions based on their performance. The primary aim of Green Audits is to enhance environmental sustainability in institutions, colleges, companies, and organizations. This is achieved through initiatives such as waste management, energy conservation, and other eco-friendly practices, ultimately fostering a greener and more sustainable environment.

2.2 Objectives of Green Audit:

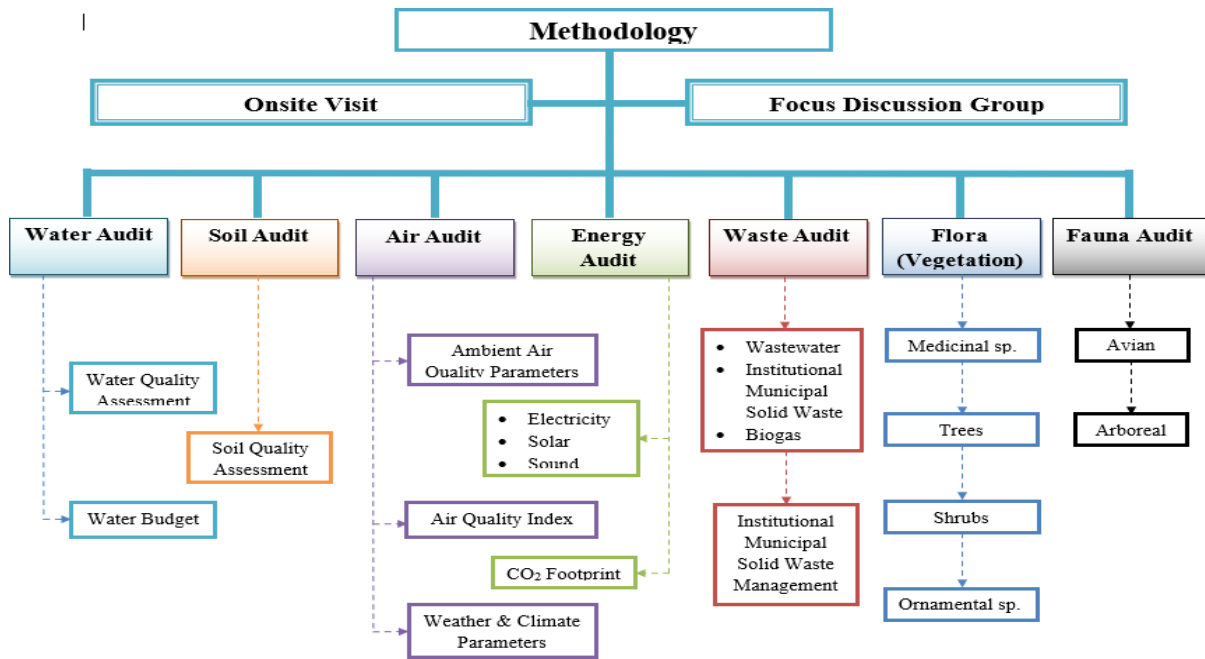
The main aim objective of this Environmental Audit is to assess the environmental quality and the management strategies being implemented and the conformation to the standards prescribed for management of environmental segments by Yeshwantrao Chavan College of Engineering, Nagpur.

- 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:** Assessing raw water intake facilities and evaluating water treatment infrastructure. The audit also explores water harvesting techniques to store water for use during scarcity. The auditor identifies suitable methods to balance water demand and supply efficiently.
- **Waste Disposal Audit:** Reviewing waste clearance measures, including hazardous waste management and recycling processes. The auditor evaluates existing waste disposal policies and recommends effective strategies to address waste management challenges.
- **Energy Audit:** Examining energy conservation practices and identifying ways to reduce consumption and minimize pollution. The auditor assesses energy utilization methods to ensure efficient and sustainable energy use.
- **Environmental Quality Audit:** Monitoring air quality, noise levels, and plantation initiatives undertaken by the institution. Maintaining a Green Belt is emphasized to reduce pollution and lower carbon dioxide levels.
- **Health Audit:** Evaluating occupational health risks and safety measures within the institution. The audit also promotes initiatives that encourage students to respect and conserve the environment through afforestation, which helps reduce carbon dioxide emissions.
- **Renewable Energy Utilization:** Promoting the use of renewable energy sources such as solar, wind, rainwater, and tidal energy. These sustainable resources are highlighted for their environmental benefits and minimal pollution impact, with the audit team emphasizing their importance in long-term energy management.
- **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:

The Green Audit was conducted in a structured manner following these steps:

1. **Campus Visit:** The Green Audit team conducted an on-site visit to assess the institute's environmental practices.
2. **Initial Discussions:** The team held discussions with key staff members, including the NAAC Criteria In-charge, maintenance manager, and external service providers such as the building architect, responsible for implementing sustainable practices across the campus.
3. **Guideline Compliance:** It was agreed to follow the NAAC Criteria guidelines for evaluating green initiatives.
4. **Awareness Creation:** The audit team educated staff members about the significance of Green Audits and their role in enhancing the institute's overall environmental performance.
5. **Physical Verification:** A comprehensive campus tour was conducted to inspect the presence and effectiveness of various green initiatives and sustainability facilities.
6. **Identification of Improvement Areas:** The team analyzed existing green systems and identified potential areas for enhancement and sustainable development.
7. **Technical and Economic Feasibility Analysis:** The team discussed the feasibility of implementing new sustainability measures with institute staff and management.
8. **Draft Report & Presentation:** A preliminary report outlining findings and recommendations was prepared and presented to the management for review and feedback.
9. **Final Report Submission:** After incorporating suggestions from the management, staff, and audit team members, the final Green Audit report was completed and submitted to the institute.

2.5 Area Statements

Yeshwantrao Chavan College of Engineering (YCCE) boasts a well-planned and systematically designed infrastructure. All classrooms are spacious, well-ventilated, and provide a comfortable learning environment. As one of the country's premier educational institutions, YCCE offers a vast, beautiful, and pollution-free campus spread over 14 acres, featuring extensive playgrounds, experimental fields, and a botanical garden. The campus is equipped with a Central Library, hostels for both boys and girls, an Administrative Block, a spacious auditorium, a Computer Center, a Health Center, a Yoga Centre, a Horticulture Section, a Canteen, and an ATM. Each academic department is housed in spacious buildings with well-equipped laboratories and state-of-the-art facilities. The Central Library has an extensive collection of books available for issuance or reading, with ample seating space for students. Additionally, students can access the Internet and benefit from power backup facilities. The Wi-Fi-enabled campus ensures seamless connectivity, while the Book Bank facility allows students to borrow books for the entire academic session. The computer laboratories provide access to advanced web-based resources, with subscriptions to e-resources that connect students and researchers to essential academic databases. YCCE also promotes a healthy and active lifestyle, offering facilities for both indoor and outdoor sports, ensuring students have access to a well-rounded educational experience.

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

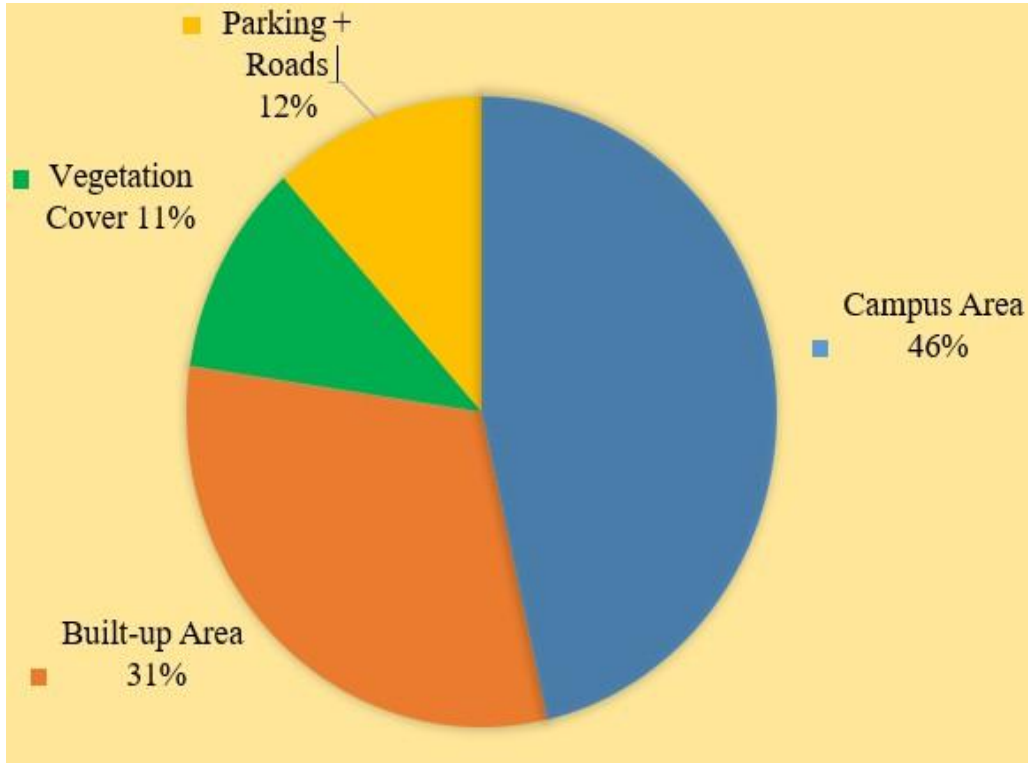


Table No. 3: Department wise built-up Area at YCCE

Sr. No.	Name of Department Building	Floors	Built-up Area (Sq.m)
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
Total Built- up Area			37702.76

* G - Ground Floor

G.F. - Ground Floor

Table No. 4: Infrastructure of YCCE

Sr. No.	Description	Nos.
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

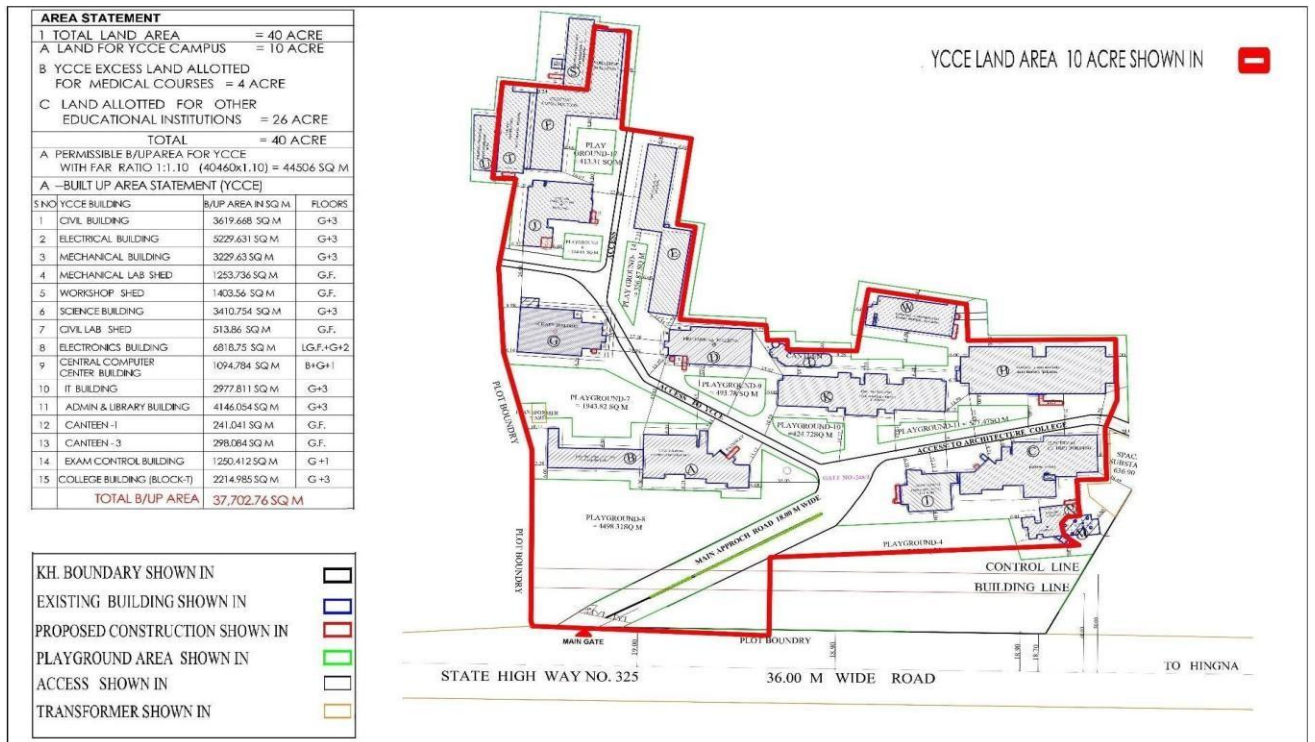


Image No. 7: Satellite image of YCCE campus

The YCCE campus offers well-maintained outdoor sports facilities, including a cricket ground, football ground, and basketball court. These spaces are not only used for sports but also serve as venues for cultural competitions and events. For academic and professional gatherings, YCCE features a 1000-seat auditorium, ideal for seminars, conferences, and other large-scale events. Ensuring the well-being of students and staff, YCCE has a dedicated health center and is affiliated with renowned hospitals to provide essential medical care and first-aid facilities. The institute is committed to continuous improvement, regularly upgrading and enhancing its existing infrastructure and amenities. Below are some photographs showcasing the major buildings and facilities on the YCCE campus.

Image No. 8: Building infrastructures of YCCE campus



Main Entrance



Administration Building and Library



Temple



Student Parking's



Civil Engg. Department



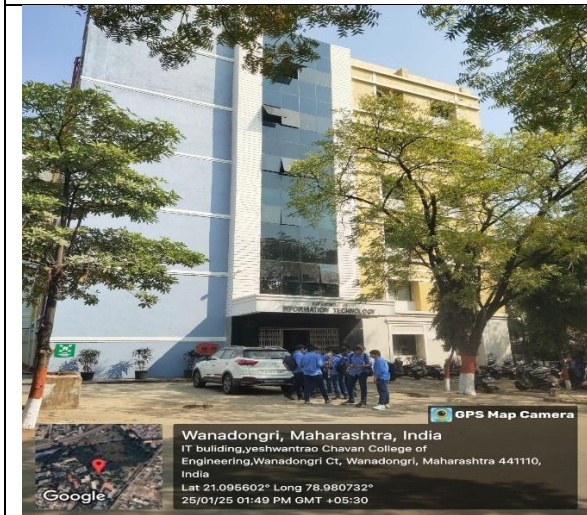
Mechanical Engg. Department



Applied Science & Hum. Department



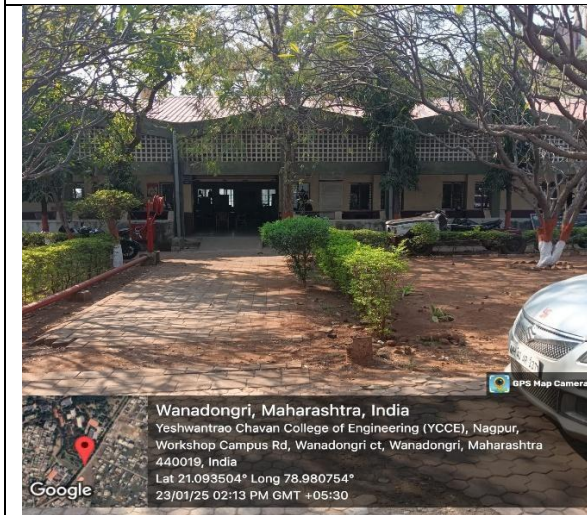
Staff Parking



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 an essential natural resource for all living organisms, freely available depending on the climate and topographical features of a region. However, while water is abundant in nature, potable (drinkable) water is not readily available for human consumption. Although 70% of the Earth's surface is covered by water, only 3% of it is freshwater, making access to clean drinking water a global challenge.

Currently, around 1.1 billion people worldwide face water scarcity, with water pollution and wastage playing a significant role in this crisis. The alarming rate of water contamination poses serious health risks, leading to diseases and even fatalities. Therefore, ensuring that drinking water is safe, clean, and free from harmful bacteria and pollutants is crucial. Additionally, conserving, protecting, and managing water resources is essential for sustainable usage. At YCCE, the quality and usage of water on campus are regularly examined. Water auditing is conducted to assess raw water intake, evaluate water treatment facilities, and explore methods for reuse. The audit investigates sustainable approaches to balancing water demand and supply.

Major Drinking Water Sources at YCCE:

1. **Maharashtra Jeevan Pradhikaran (MJP)**
2. **Raipur water user society**
3. **Groundwater Well**
4. **Borewells (2 Nos.)**

Water samples are collected using the purposive sampling method from the common sump and analyzed for physico-chemical and biological characteristics to assess both the qualitative and quantitative aspects 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 established several standards to ensure the quality of drinking water in India. These standards may be periodically updated, and it is advisable to refer to the latest documents from the BIS or other relevant authorities for the most current information. Some key standards related to drinking water include:

- **IS 10500:2012 - Drinking Water Specification:** This standard specifies 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 the specifications for packaged drinking water (excluding natural mineral water). It outlines the requirements for raw water quality, processing, and the final product.
- **IS 13428:2005 - Packaged Natural Mineral Water - Specification:** This standard defines the specifications for natural mineral water, including requirements for the water source, composition, and labeling of packaged natural mineral water.
- **IS 14543:2004 - Packaged Drinking Water (Natural Mineral Water) - Specification:** This standard specifies the requirements for packaged drinking water produced from a source that may or may not be classified as natural mineral water.

- **IS 16240:2015 - Drinking Water - Reverse Osmosis Systems for Household and Similar Use - Performance Requirements:** This standard focuses on the performance criteria for reverse osmosis systems used in households and similar settings 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 ₂), 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,	30	100	—

	Max			
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 ₃), mg/l, Max	45	No relaxation	—
17)	Phenolic compounds (as C ₆ H ₅ 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 ₄) mg/l, Max	200	400	—
21)	Sulphide (as H ₂ S), mg/l, Max	0.05	No relaxation	—
22)	Total alkalinity as calcium carbonate, mg/l, Max	200	600	—
23)	Total hardness (as CaCO ₃), 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, Max	0.003	No relaxation	—
ii)	Cyanide (as CN), mg/l, Max	0.05	No relaxation	—
iii)	Lead (as Pb), mg/l, Max	0.01	No relaxation	—
iv)	Mercury (as Hg), mg/l, Max	0.001	No relaxation	—
v)	Molybdenum (as Mo), mg/l, Max	0.07	No relaxation	—
vi)	Nickel (as Ni), mg/l, Max	0.02	No relaxation	—
vii)	Pesticides, µg/l, Max	—	No relaxation	—
viii)	Polychlorinated biphenyls, mg/l, Max	0.000 5	No relaxation	or APHA 6630
ix)	Polynuclear aromatic hydrocarbons (as PAH), mg/l, Max	0.000 1	No relaxation	—
x)	Total arsenic (as As), mg/l, Max	0.01	0.05	—
xi)	Total chromium (as Cr), mg/l, Max	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	Shall not be detectable in any 100 ml sample

	bacteria	
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

Sr. No	Characteristics Parameters	Values
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 ₃ , mg/L)	195
14)	Total Hardness (as CaCO ₃ , mg/L)	164
15)	Carbonate	Absent
16)	Bicarbonate (HCO ₃)	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 (Internal)



Nagar Yuwak Shikshan Sanstha's
Yeshwantrao Chavan College of Engineering
 (An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)
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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 :- 6th Jan.2025

To,
The HOD,
CCC Department,
YCCE Campus, Nagpur.

Subject: Test results of water sample of CCC Department, YCCE Campus, Nagpur.

Respected Sir,

Following are results for the water sample send by you 02/01/2025.

Sr. No.	Parameter	Permissible limit by IS10500	Results
1.	Physical appearance	Unobjectionable	Colorless
2.	Odor	Unobjectionable	Odorless
3.	Turbidity	5NTU	0 NTU
4.	pH	6.5- 8.5	7.2
5.	Total Hardness	200mg/l	60 mg/l
6.	Chloride	250mg/l	29.5 mg/l
7.	Total Dissolved Solids	500mg/l	92 mg/l
10.	Dissolved Oxygen	8mg/l	7 mg/l
11.	Total alkalinity	600mg/l	84 mg/l
12.	Nitrate	45mg/l	-
13.	Sulphate	200mg/l	0 mg/l
14.	Magnesium	30mg/l	10.69 mg/l
15.	Calcium	75mg/l	80 mg/l
16.	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.

[Signature]
6/1/25

Dr. Khalid Ansari
I/c WSSE Lab
AGRI. OFF. 0936279
Department of Civil Engineering
Y.C. College of Engineering
NAGPUR - 441 110



[Signature]

Dr. S.P. Raut
Head,
CE, YCCE, Nagpur
9284474337
Department of Civil Engineering
Y. C. College of Engineering
NAGPUR-441.110

Table No. 10: Water Source at YCCE

Sr. No.	Month & Year	Quantity of Water delivered (Cu.m)			
		MIDC	Amount Paid	Raipur Water User	Amount Paid
1	Jan-23	10999	122086	247	61750
2	Feb-23	10511	120492	188	47000
3	Mar-23	3831	23425		
4	Apr-23	1743	16123	1256	314000
5	May-23	5723	53507		
6	Jun-23	2719	25151		
7	Jul-23	4287	39655		
8	Aug-23	530	11100		
9	Sep-23	6700	64652	235	58750
10	Oct-23	9500	93037	288	72000
11	Nov-23				
12	Dec-23	3648	42528	599	149750
13	Jan-24	4652	43031		
14	Feb-24				
15	Mar-24	4098	25895	334	83500
16	Apr-24	8058	83130		
17	May-24	8395	88731	640	160000
18	Jun-24				
19	Jul-24				
20	Aug-24				
21	Sep-24				
22	Oct-24	6523	61832	617	154250
23	Nov-24	5146	47601		
24	Dec-24	2308	21349		
Total		117270 Cu.m	Rs. 1158937		
Total Amount Paid towards water – Rs. 22,59,937					

* 1 Unit-10000 Lit. of water

Table No. 11: 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. 12: Department-wise Water Tank Provision

Sr. No.	Department	Type of tank	Capacity in .Ltrs	Quantity
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
Total			7,41,720	

Table No. 13: Water Dispensing Connectivity

Sr. No.	Tap			Water Coolers	
	Department	Regular water	Drinking water		
1)	CSE Building	Ground Floor	3	1	1
		1 st Floor	5	1	1
		2 nd Floor	5	1	1
		3 rd Floor	0	1	1
2)	IT Building	Ground Floor	7	1	0
		1 st Floor	7	1	1
		2 nd Floor	7	2	1
		3 rd Floor	7	1	1
3)	Old Science Building	Ground Floor	40	1	1
		1 st Floor	11	1	1
		2 nd Floor	4	1	1
		3 rd Floor	6	1	0
4)	Civil Building	Ground Floor	14	2	1
		1 st Floor	9	2	0
		2 nd Floor	3	2	1
		3 rd Floor	6	2	0
5)	Mechanical Building	Ground Floor	4	2	0
		1 st Floor	4	0	1
		2 nd Floor	4	2	1
		3 rd Floor	5	2	0
6)	Administration Building	Ground Floor	13	0	1
		1 st Floor	5	2	0
		2 nd Floor	5	0	1
		3 rd Floor	6	0	1
7)	COE Building	Ground Floor	11	0	1
		1 st Floor	11	2	1
8)	Electronics Building	Ground Floor	23	9	0
		1 st Floor	18	0	2
		2 nd Floor	18	0	2
9)	Electrical Building	Ground Floor	6	2	1
		1 st Floor	8	3	1
		2 nd Floor	4	4	1
		3 rd Floor	4	3	1
10)	CCC Building	Ground Floor	7	1	1
		1 st Floor	5	1	1
11)	Workshop 1	Ground Floor	9	1	1
12)	Workshop 2	Ground Floor	8	1	1
13)	Swaragi Canteen	Ground Floor	2	1	1
Total			314	57	32

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

Image No. 11: Water Dispensing units in YCCE Campus



The institute stores water in both an overhead tank and an underground sump, as detailed in Table No. 13, with a combined storage capacity of approximately 7.4 lakh liters. However, the organization currently lacks an automatic leak detection system, and any leakage issues are addressed through manual observation. This presents a challenge in tracking water wastage, which should be considered when designing a water conservation plan.

During the audit, overflow was observed from the tank in civil engineering dept. also, some leaks were found in taps, particularly in the urinals. There are approximately 1200 taps across the campus, used for various purposes. The institute has a tap maintenance schedule managed by the maintenance department, and leakages are addressed based on complaints received.

3.2 Sewage Effluent Generation

- **Laboratory Wastewater (Effluent):** This includes the wastewater produced in the laboratories, particularly the First Year Chemistry Laboratory and the Environment Laboratory in the Civil Engineering department. Each laboratory generates approximately 1000 liters of effluent per week. Currently, this effluent is released into the common drainage system without any treatment, posing environmental risks and concerns about groundwater contamination.
- **Domestic Wastewater (Sewage):** This primarily includes wastewater from toilets, hostels, kitchens, and the canteen. The generated sewage is transferred to the sewage treatment plant for processing. Efforts should be made to implement appropriate treatment methods for both effluent and sewage to mitigate environmental impact and ensure sustainable water management.

3.3 Rainwater Harvesting Potential at YCCE

The YCCE campus is located in the western part of Nagpur city, along Hingna Road, surrounded by both residential and industrial areas. The campus accommodates over 6,000 people, including students and staff. To meet its domestic water needs, the campus relies on a combination of borewells, a well, and water sourced from MJP & MIDC. Additionally, an open well situated on the campus serves as a potential supplementary source for water.

As the student and staff population grows, the water demand on campus has steadily increased. This rise in water consumption is contributing to the growing water scarcity issue, which has become a widespread concern across India. The issue of water scarcity is also being increasingly felt within the YCCE campus. If not addressed promptly and properly, this problem could pose a significant challenge to the campus's future development. The **average** monthly rainfall data for Nagpur city, obtained from the **Regional Meteorological Centre of the India Meteorological Department, Mumbai**, is used to estimate the rainfall for the YCCE campus. The monthly rainfall data for Nagpur is provided in Table No. 1, which is assumed to be applicable to the YCCE campus as well.

Table No.14: 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
Total		1166.3

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

Table No. 15: Calculation of Rooftop Area of All Building in YCCE Campus

Sr. No.	Building Name	Roof top Area (m ²)
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
Total		8070.00

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 m²

Average annual rainfall at Nagpur=1166 mm/year = 1.166m³/year Total volume of surface runoff water supposed to be collected=8070.00 x 1.1663 = 9412.05 m³/year

Table No. 16: Annual Rooftop Rainwater Harvesting Potential at YCCE

Sr. No.	Month	Rainfall (mm)	Discharge (m ³)/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
Total		1166.3	9412.05
Two Year Discharge		18825 Cu.m	

Table No. 17: 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	44040 Cu.m	Drinking, Irrigating Lawns	Distillation, Washing Glassware, Others	Flushing, Washing, Cleaning Toilets, etc	129048 Cu.m	129048 Cu.m
2	MIDC	117270 Cu.m	Drinking, Irrigating Lawns	Distillation, Washing Glassware, Others	Flushing, Washing, Cleaning Toilets, etc		

Observation & Recommendations

- 1) To eliminate the spillage and over usage of water in washbasins, urinals and toiler push taps are highly recommended.
- 2) Rain Water Harvesting as per the guidelines of Central Ground Water Board shall be done for rest of buildings.
- 3) 80 % of total quantum of ground water extracted shall be recharged to ground either by Artificial Recharge Structures within the college premises
- 4) 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
- 5) Special Internal Water Audit to be conducted yearly
- 6) Advance treatment systems should be upgrade in existing STP, so that reuse of treated water for flushing in toilets and also gardening purpose
- 7) Suggested to conduct a detailed study on geological and hydrogeological mapping of the area to water passing through road, gutter etc
- 8) The campus may create more water bodies of different dimensions at different locations using rainwater as its primary source.
- 9) Construction of sub-surface Contur bund
- 10) There is requirement of water flow meters in distribution line to quantify water consumption in departments
- 11) It is also observed that water overflow from overhead water tanks

4.0 Air Audit

In addition to land and water, air is a vital resource for sustaining life. In recent years, even medium and small towns and cities have seen a rise in pollution, which is increasingly evident in the non-attainment cities of India. Air pollution has become a growing concern, primarily due to its detrimental effects on health. Therefore, continuous monitoring of air quality is crucial for human well-being. One method to assess air quality is by reporting the concentrations of pollutants within acceptable levels. The Air Quality Index (AQI) is an integrated measure that converts the weighted values of individual air pollution parameters (such as pollutant concentrations) into a single number or a set of values for easier interpretation. To monitor air quality at YCCE, air sampling was carried out using the purposive random sampling method at various locations across the campus. The collected data was analyzed to determine the qualitative and quantitative levels of air pollutants. Based on this data, an Air Pollution Index for the campus was generated. The primary sources of pollution on the YCCE campus include diesel/petrol vehicles, air-conditioners, power generators, kitchen waste and other biodegradable waste from the canteen, electronic appliances, and other activities.

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

Table No. 18: 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
Total		161	189

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. 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. 19: National Ambient Air Quality Standards

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

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

Table No. 20: Qualitative and Quantitative Characteristics of Air at different locations at YCCE

Sr. No.	Months	Locations	CO	NO ₂	SO ₂	RSPM	SPM	O ₃	NH ₃
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, NO₂- Nitrogen dioxide SO₂- Sulphur dioxide RSPM - Respirable Suspended Particulate matter SPM - Suspended Particulate matter O₃- Ozone NH₃- Ammonia

Table No. 21: 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) 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
- 2) Exhaust gases shall be monitored, analyzed and check regularly
- 3) Parking zone of college shall be neat & clean.
- 4) Use of bicycle in campus to be promoted.

5.0 Weather & Climate Audit

Weather refers to the mix of events occurring in the atmosphere each day. While Earth has a single atmosphere, weather varies across different regions and changes over time—minutes, hours, days, and weeks. The majority of weather phenomena occur in the troposphere, the layer of the atmosphere closest to the ground. While weather pertains to short-term atmospheric changes, climate describes the typical weather patterns over a longer period in a specific region. Different areas experience different climates, which influence their overall weather conditions. Weather is shaped by multiple factors, including air temperature, atmospheric pressure, humidity, precipitation, solar radiation, and wind speed. These elements can be measured to define local weather patterns and assess the quality of atmospheric conditions. The environmental impacts of weather parameters play a significant role in the surrounding ecosystem's health. The weather elements form a chain reaction that affects more than just the atmosphere. For instance, temperature, pressure, and humidity can combine to form clouds, which then influence solar radiation for plants or increase precipitation, affecting local water bodies. High temperatures can heat both the air and nearby water bodies, while insufficient rainfall impacts soil moisture and water levels due to evaporation. Wind speed and direction can signal approaching fronts or affect water body dynamics by creating waves or mixing stratified water layers. Monitoring weather conditions is crucial for establishing a database of typical environmental states. Any deviations from these norms can be used to explain or predict weather events. Regular weather monitoring is essential not only for understanding environmental baselines but also for ensuring optimal working conditions, supporting marine studies, and ensuring safety during recreational activities.

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



Table No. 22: Qualitative and Quantitative Characteristics of Weather and Climate at YCCE

Sr. No.	Location	Air Temp (°C)	Relative Humidity (%)	UV Index	Pressure KPa	Wind Speed Km/hr	Wind Chill (%)	Dew Point (°C)	Cloud Cover (%)
		Min.- max.							
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) Weather monitoring instruments like thermometer, humidity meter, should be maintain in the campus and are calibrated regularly to maintain accuracy.
- 2) Communicate with nearby public societies to enhance awareness of weather and climate data quality and reliability.
- 3) Improving Ventilations: - Installing additional windows, ventilators, or exhaust system to improve cross ventilation.
- 4) Air quality Management: - Install air purifiers in high densities areas such as auditoriums, classrooms and labs
- 5) Energy efficient Upgrades: Replace outdated air conditioning units with energy efficient systems compliant with green building standards.
- 6) Maintenance or standard cleanliness: - Implement a biannual program for air ducts, Filters and fans
- 7) Green campus initiatives: Increase greenery on campus with pollution absorbing plants that improve air quality.

6.0 Soil Audit

Soil plays a crucial role as the medium for plant growth and supports a wide range of animal and human activities. It acts as a reservoir, providing essential nutrients and water to plants throughout their growth cycle. Along with the plants it nurtures, the underlying rock, and the climate it experiences, soil forms a finely balanced system. Soil performs a variety of functions that are vital to natural ecosystems, agricultural productivity, environmental quality, and even the construction of buildings. Among these, the function related to agricultural productivity is perhaps the most widely recognized. Soil is essential for supporting both plant and animal life, while also maintaining or improving water and air quality, and supporting human habitation. For soil to fulfill its production function, it must provide several key elements:

- A physical, chemical, and biological environment conducive to the survival and growth of living organisms.
- The ability to regulate and manage water flow, store and recycle nutrients and other elements.
- Conditions that support biological activity and diversity, essential for plant growth and animal productivity.
- The capacity to filter, buffer, degrade, immobilize, and detoxify both organic and inorganic substances.
- Mechanical support for living organisms and their structures.

To assess the soil quality on the YCCE campus, soil samples were randomly collected from various locations across the campus. These samples were then equilibrated using the quartering and coning method. Large stones and mud balls were removed, and the soil was sieved through a fine sieve before being subjected to detailed physico-chemical analysis to assess its quality and composition.

Image No. 14: Sampling Locations of Soil Component



Table No. 23: 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 mm hos/cm), (1ppm=640 Mm hos/cm)	Up to 1.00	Average
		1.01-2.00	Harmful to germination
		2.01-3.00	Harmful to crops
3)	Organic carbon (%)	Up to 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)	Up to 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. 24: 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.
- 3) Assess the current water management practices and suggest improvements to avoid waterlogging or excessive drainage.
- 4) Soil Testing: Conduct regular soil tests to determine pH, nutrient levels, and contaminants.
- 5) Organic Amendments: Use organic amendments like compost, manure, or green manure to improve soil fertility and structure.
- 6) Drip Irrigation: Implement drip irrigation systems in gardens and landscaping areas to reduce water waste and promote efficient water use.
- 7) Integrated Pest Management (IPM): Implement IPM practices to minimize chemical pesticide use and promote beneficial insects.

7.0 Vegetation Audit: Flora Diversity

Trees are vital for both people and the planet. Research has consistently shown that the presence of trees and green spaces in urban areas can significantly enhance people's mental and physical well-being. Benefits include improved attention span and test scores in children, increased property values, and better overall health for communities. Additionally, trees contribute to cooling urban environments and help mitigate climate change. Urban forests offer a wide range of ecosystem services that improve city living. These benefits include reducing energy consumption, removing air pollution, boosting property values, stimulating local economies, and supporting tourism. One of the key health benefits trees provide is reducing air pollution, which is vital for improving public health. Tree cover has also been linked to improved academic performance. Studies show that students who have access to views of trees and green spaces from their classrooms perform better academically. This is particularly evident in attention span and recovery from stress, where students in classrooms with views of greenery outperformed those in classrooms with no windows or views of brick walls. Learning in the presence of nature fosters better engagement and promotes quality education, which has long-term societal benefits.

At Yashwantrao Chavan College of Engineering (YCCE), the campus is home to approximately 155 species of trees. Tree plantation programs are organized every July and August in the college campus and surrounding villages, helping to create an eco-friendly environment and promoting awareness about environmental sustainability. These programs focus on planting indigenous species, including ornamental and medicinal varieties. While biodiversity is encouraged, there is a dominant presence of certain species, such as Neem, Pongam Tree, Amaltash, Copperpod, and Sita Ashok. The campus flora was studied using observation and identification methods. The vegetation was categorized into four main groups: Shrubs, Ornamental Species, Medicinal Species, and Tree Species. Each tree species was marked with its geospatial data, allowing for an accurate count of individual trees and helping identify the most dominant species on campus. This data serves to guide future plantation efforts and promote biodiversity within the campus ecosystem.

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

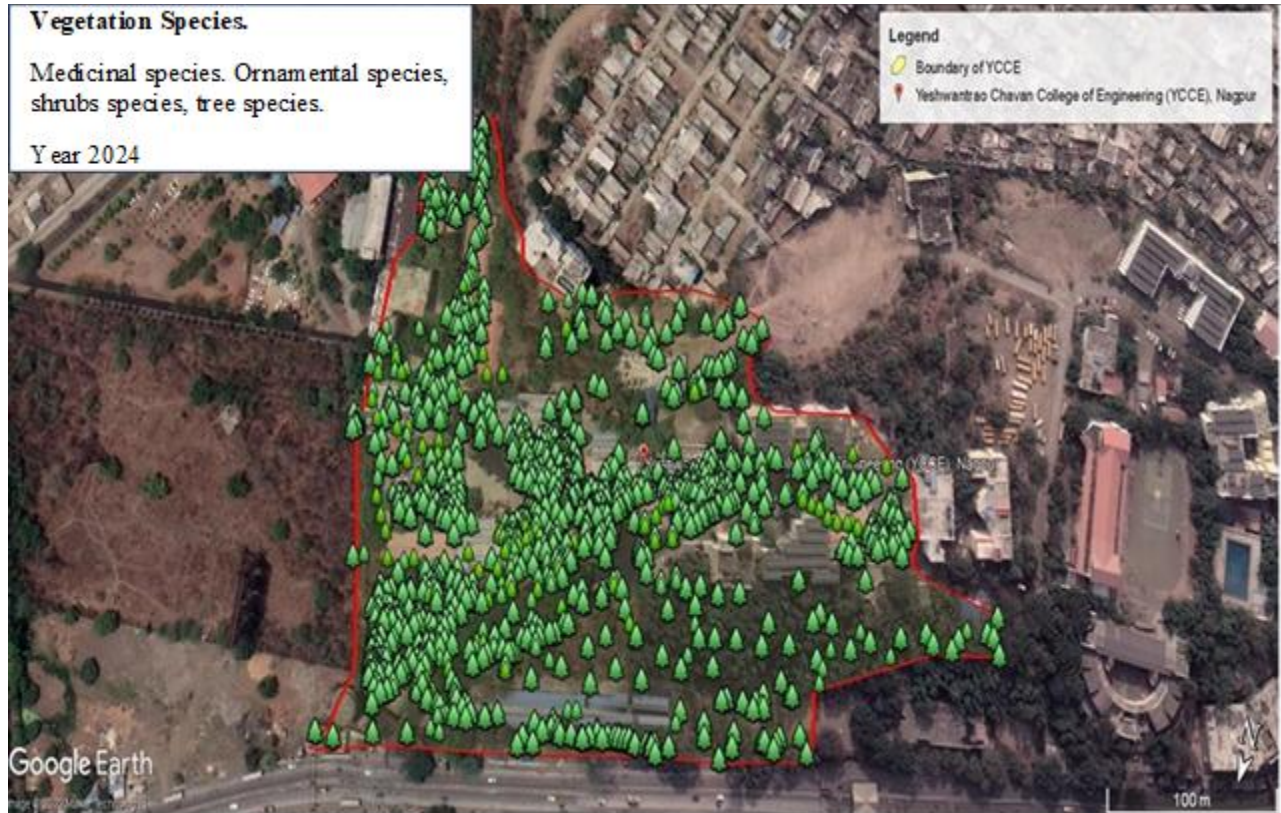


Image No. 20: Vegetation Pics in the Campus





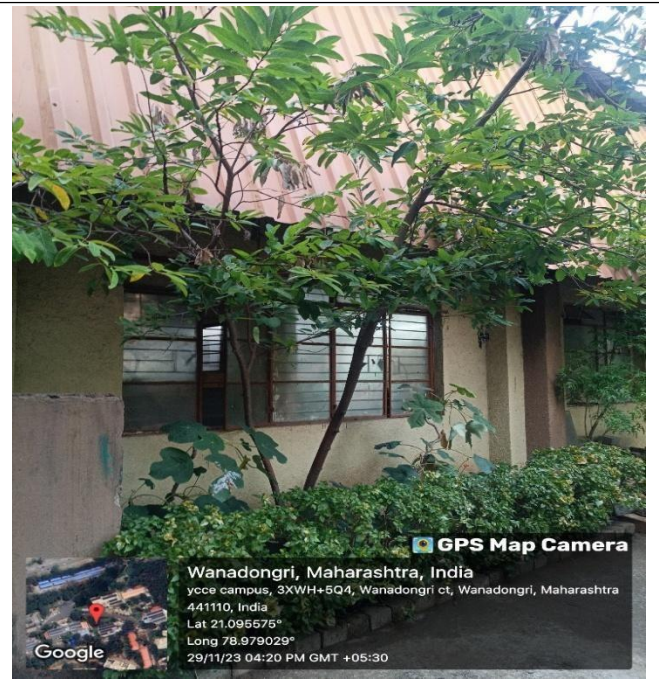


Table No. 25: Vegetation at YCCE: I] Medicinal Species

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
Total			66

Table No. 26: 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. 27: Vegetation at YCCE: II] 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)	Cestrum nocturnum	Night jasmine	1
29)	Chlorophytum comosum	Spider plant	3
30)	Codiaeum variegatum	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
Total			617

Table No. 28: 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 (L.) juss. Ex</i>	Yellow-bells	2	0.324
16)	<i>Acalypha wilkesiana</i>	Copperleaf	11	1.783
17)	<i>Agave sisalana perrine</i>	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. 29: Vegetation at YCCE: III] Shrubs Species

Sr. No.	Scientific Name	Common Name	Total Species
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 erranthemum	5
6)	<i>Acalypha indica</i>	Indian Copperleaf	6
7)	<i>Buglossoides purpureo 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 92orficata92</i>	Crape jasmine	9
30)	<i>Tridax procumbens</i>	Coatbuttons	12
Total			274

Table No. 30: Relative Density of Shrub Species

Sr. No.	Scientific Name	Common Name	No. of Individual	Relative Density
1)	<i>Coffea arabica L.</i>	Arabian coffee	11	4.015
2)	<i>Comoclinium coelestinum</i>	Blue mist flower	29	10.584
3)	<i>Jasminium sambac</i>	Arabian jasmim	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 purpuro 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. 31: Vegetation at YCCE: IV] Tree Species

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

38)	<i>Ficus benjamina</i>	weeping fig	3
39)	<i>Citrus aurantifolia</i>	Sweet orange	4
40)	<i>Campsis radican</i>	Trumpet vine	7
41)	<i>Terminalia catappa</i>	Indian almond	5
42)	<i>Bambusa vulgaris</i>	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
Total			718

Table No. 32: Relative Density of Tree Species

Sr. No.	Scientific Name	Common Name	No. of Individual	Relative Density
1)	<i>Saraca asoca</i>	Ashoka	112	15.599
2)	<i>Ficus religiosa</i>	Peepul	1	0.139
3)	<i>Roystonea regia</i>	Cuban royal palm	5	0.696
4)	<i>Casuarina cunninghamiana</i>	Beefwood	9	1.253
5)	<i>Ficus cyanthistipula</i>	African fig tree	2	0.279
6)	<i>Syngonium podophyllum</i>	Arrowhead vine	6	0.836
7)	<i>Hymenocallis littoralis</i>	Beach spider lily	1	0.139
8)	<i>Ligustrum lucidum</i>	Chinese privet	2	0.279
9)	<i>Psidium guajava</i>	Common guava	3	0.418
10)	<i>Roystonea regia</i>	Cuban royal palm	5	0.696
11)	<i>Murraya koenigii</i>	Curry leaf	8	1.114
12)	<i>Alstonia scholaris</i>	Dita bark	41	5.710
13)	<i>Hyphene coriacea</i>	Doum palm	4	0.557
14)	<i>Plumeria rubra</i>	Frangipani	4	0.557
15)	<i>Plumeria pudica</i>	Golden arrow	4	0.557
16)	<i>Lonicera japonica</i>	Honeysuckle	4	0.557
17)	<i>Washingtonia robusta</i>	Mexican fan palm	4	0.557
18)	<i>Bauhinia orficata</i>	Orchid tree	4	0.557
19)	<i>Ficus religiosa</i>	Sacred fig	4	0.557
20)	<i>Cycus revoluta</i>	Sago palm	4	0.557
21)	<i>Phoenix reclinata</i>	Senegal date palm	4	0.557
22)	<i>Annona squamosa</i>	Sugar apple	4	0.557
23)	<i>Citrus sinensis</i>	Sweet orange	4	0.557
24)	<i>Terminalia catappa</i>	Tropical almond	4	0.557
25)	<i>Schotia brachypetale</i>	Weeping boer bean	4	0.557
26)	<i>Platyclusus orientalis</i>	Chinese arborvitae	4	0.557
27)	<i>Juniperus chinensis</i>	Chinese juniper	4	0.557
28)	<i>Thuja occidentalis</i>	Northern white cedar	4	0.557
29)	<i>Cupressus sempervirens</i>	Mediterranean cypress	4	0.557
30)	<i>Carica papaya</i>	Papaya	4	0.557
31)	<i>Alstonia scholaris</i>	Ditabark	4	0.557
32)	<i>Roystonea regia</i>	Cuban royal palm	4	0.557
33)	<i>Senna siamea</i>	Siamese cassia	6	0.836
34)	<i>Caesalpinia echinata</i>	Brazil wood	15	2.089
35)	<i>Albizia lebbek</i>	Frywood	2	0.279
36)	<i>Alstonia scholaris</i>	Devil tree	3	0.418
37)	<i>Plumeria obtusa</i>	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 amboo	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>Platyclusus orientalis</i>	Chinese arborvitae	9	1.253
47)	<i>Platyclusus 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 (bird species) serves as a crucial ecological indicator for assessing the quality of habitats. The destruction of natural habitats, such as cutting down nesting trees and foraging plants for commercial purposes, is a major threat to avian habitats, leading to a decline in available foraging grounds and nesting sites. Urban areas often experience high bird densities, which can be attributed to factors like abundant food sources, low predation risks, or a combination of both. Birds are vital components of ecosystems, helping to maintain the trophic level (food chain), and thus their study is essential for ecosystem health. Birds are regarded as excellent bio-indicators of the impacts of urbanization on ecosystems due to their diversity and visibility within ecosystems. They quickly respond to changes in the landscape's configuration, composition, and function. Studying avian communities across various habitats enhances our understanding of the general patterns and processes that define bird species and communities. At Yeshwantrao Chavan College of Engineering (YCCE), the fauna species were documented using observation and identification methods during field excursions. The species observed were photographed to serve as evidence of their presence on campus. This data is valuable for understanding the type of ecological food chain within the environmental segment of the YCCE campus and contributes to the broader understanding of campus biodiversity.

Image No. 21: Sampling Area for Fauna Audit



Table No. 33: 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. 34: Insect species at YCCE

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

Table No. 35: Reptile Species at YCCE

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

Table No. 36: Amphibian Species at YCCE

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

Table No. 37: Rodent Species at YCCE

List of Rodent Species		
Sr. No.	Scientific Name	Common Name
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) The selection of trees species to be based on environmental conservation and carbon sequestration value.
- 3) Artificial nests and water ponds are recommended to attract different birds in their migrating and breeding season.
- 4) Include bamboo and other fast-growing, high-carbon-absorbing plants in the landscapedesign.
- 5) Set up composting units to convert plant and food waste into natural fertilizer, reducing methane emissions from landfill decomposition.
- 6) Green Parking Zones: Introduce permeable pavement and tree-lined parking areas to absorb CO₂ and reduce heat buildup from asphalt surfaces.
- 7) Install nesting boxes for birds and small mammals to promote natural pest control and ecological balance.

9.0 Energy Audit: Electric Energy

Electricity is an essential natural resource and one of the most widely used forms of energy across the globe. Historically, many cities and towns were established near waterfalls, which served as a primary source of mechanical energy to power water wheels for various tasks. Similarly, electric utility power stations utilize turbines, engines, water wheels, and other machines to drive electric generators, converting mechanical or chemical energy into electricity. Electricity is measured in units called watts, named after James Watt, the inventor of the steam engine. The total electricity generated by a power plant or consumed by a customer is measured in kilowatt-hours (kWh), which tracks the amount of energy used over time. At Yeshwantrao Chavan College of Engineering (YCCE), an in-depth analysis of electricity consumption was conducted, examining daily and monthly usage as well as departmental energy consumption. A comprehensive inventory of all electrical equipment was created, noting the amount of energy consumed by each device.

Energy Use and Sustainability Goals

The analysis covers several key components of energy consumption, including energy sources, energy monitoring, lighting, appliances, natural gas, and vehicles. Energy use is a crucial aspect of sustainability on campus, making its assessment integral to the institution's environmental strategy.

Aims and Objectives:

1. **To reduce conventional electricity consumption:** Minimizing reliance on traditionally generated electricity.
2. **To utilize non-conventional energy sources:** Integrating alternative energy sources like solar power.
3. **To adopt carbon-neutral electricity:** Striving towards energy solutions that minimize carbon emissions.
4. **To reduce electricity expenses:** Focusing on energy efficiency to lower operational costs.

Energy Sources at YCCE:

- Solar energy
- Electrical energy
- Diesel
- Petrol
- LPG

Energy Conservation Practices

Energy conservation involves making decisions and adopting practices that reduce energy consumption. Simple actions like turning off lights when leaving a room, unplugging unused appliances, and walking instead of driving are all examples of energy-saving habits. The two main motivations behind energy conservation are to manage energy costs and reduce the strain on Earth's natural resources. While energy conservation and energy efficiency are related, they differ in practice. Energy conservation refers to using less energy by adjusting daily behaviors and habits, whereas energy efficiency involves employing technology that uses less energy to perform the same

tasks. Examples of energy-efficient technologies include LED bulbs, energy-efficient household appliances, smart thermostats, and systems like Constellation Connect.

Energy Resources at YCCE

YCCE utilizes several energy sources across its departments, support services, and administrative buildings, including:

- **Electricity**
- **Solar rooftop systems**
- **Diesel generators**

Energy audits are conducted regularly at YCCE to encourage energy conservation and reaffirm the importance of sustainable energy management on campus.

Table No. 38: Monthly utilization of Electricity at YCCE

Sr. No.	Months /Year	Units	Bill Demand (KVA)	Amount (Rs)
1.	Jan-23	33665	455	706404
2.	Feb-23	29634	455	649665
3.	Mar-23	53898	455	947550
4.	Apr-23	74555	455	1165260
5.	May-23	89584	455	1391790
6.	Jun-23	126768	455	1906550
7.	Jul-23	113780	455	1682600
8.	Aug-23	92648	455	1436070
9.	Sep-23	98253	455	1583360
10.	Oct-23	77862	455	1271480
11.	Nov-23	44751	455	869050
12.	Dec-23	53619	455	981780
13.	Jan-24	51293	455	950260
14.	Feb-24	57754	455	103315
15.	Mar-24	73063	455	1227040
16.	Apr-24	95366	455	1664250
17.	May-24	96100	455	1669720
18.	Jun-24	111315	455	1901590
19.	Jul-24	114767	455	1964720
20.	Aug-24	115483	455	2013230
21.	Sep-24	100824	455	1779510
22.	Oct-24	84884	455	1561730
23.	Nov-24	37746	455	1013640
24.	Dec-24	40667	455	869436

Table No. 39: Carbon Footprint based on Electrical Consumption

Sr. No.	Months /Year	Total Units	Amount	CO2 Emission (kg)
1.	Jan-23	33665	706404	28615.25
2.	Feb-23	29634	649665	25188.9
3.	Mar-23	53898	947550	45813.3
4.	Apr-23	74555	1165260	63371.75
5.	May-23	89584	1391790	76146.4
6.	Jun-23	126768	1906550	107752.8
7.	Jul-23	113780	1682600	96713
8.	Aug-23	92648	1436070	78750.8
9.	Sep-23	98253	1583360	83515.05
10.	Oct-23	77862	1271480	66182.7
11.	Nov-23	44751	869050	38038.35
12.	Dec-23	53619	981780	45576.15
13.	Jan-24	51293	950260	43599.05
14.	Feb-24	57754	103315	49090.9
15.	Mar-24	73063	1227040	62103.55
16.	Apr-24	95366	1664250	81061.1
17.	May-24	96100	1669720	81685
18.	Jun-24	111315	1901590	94617.75
19.	Jul-24	114767	1964720	97551.95
20.	Aug-24	115483	2013230	98160.55
21.	Sep-24	100824	1779510	85700.4
22.	Oct-24	84884	1561730	72151.4
23.	Nov-24	37746	1013640	32084.1
24.	Dec-24	40667	869436	34566.95
Total CO₂ Emission				1588037 Kg 1588 Ton

Emission factor – 0.85 kg - Kilogram

10.0 Energy Audit: Solar Energy

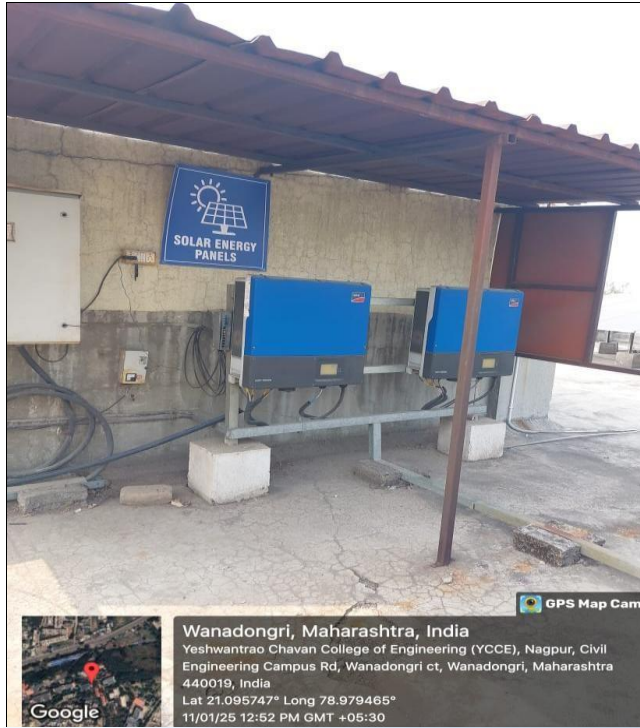
The sun is an incredible and renewable resource that has the power to sustain life on Earth and provide clean, sustainable energy for all its inhabitants. In fact, the amount of energy that reaches our planet from the sun in just one hour exceeds the total annual energy consumption of the entire global population. This immense potential can be harnessed through solar photovoltaic (PV) modules, which convert solar energy into electricity. Every day, the Earth receives approximately 200,000 times the world's total daily electric-generating capacity in the form of solar energy. Despite this vast potential, the high costs associated with collecting, converting, and storing solar energy still limit its widespread use in many regions. Solar radiation can be converted into either thermal energy (heat) or electrical energy, with the conversion to heat being simpler. At Yeshwantrao Chavan College of Engineering (YCCE), solar panels have been installed on the rooftops of each departmental building. The electricity generated by these panels is directed to the adjacent Polytechnic College, where it is used as needed. Any excess energy is sent to the power grid. Data on solar energy generation is regularly monitored to assess the solar energy potential at the YCCE campus and optimize its usage.

Table No. 40: Solar Energy Potential and CO2 Emission at YCCE

Sr. No.	Bill Month	Roof top solar net metering capacity (kW)	Total Solar Energy Generation	CO2 Emission kg
1.	Jan-23	400	66361	56407
2.	Feb-23	400	73904	62818
3.	Mar-23	400	79198	67318.3
4.	Apr-23	400	73694	62639.9
5.	May-23	400	89116	75748.6
6.	Jun-23	400	73984	62886.4
7.	Jul-23	400	49924	42435.4
8.	Aug-23	400	63028	53573.8
9.	Sep-23	400	56043	47636.55
10.	Oct-23	400	75672	64321.2
11.	Nov-23	400	59918	50930.3
12.	Dec-23	400	57528	48898.8
13.	Jan-24	400	57119	48551.15
14.	Feb-24	400	65304	55508.4
15.	Mar-24	400	80677	68575.45
16.	Apr-24	400	67705	57549.25
17.	May-24	400	79395	67485.75
18.	Jun-24	400	64842	55115.7
19.	Jul-24	400	43970	37374.5
20.	Aug-24	400	52186	44358.1
21.	Sep-24	400	59375	50468.75
22.	Oct-24	400	70780	60163
23.	Nov-24	400	59592	50653.2
24.	Dec-24	400	53678	45626.3
Total CO₂ Emission				1337044 Kg 1337 Ton
CO2 Emission from Electrical Consumption			CO2 Sequestration from Solar Energy Potential	

1588037 Kg	1337044 Kg
CO₂ emission = 250993 Kg (2509 Ton)	

Image No. 22: Solar Rooftop setup at YCCE



11.0 Vehicle Audit

A vehicle audit is a systematic process designed to gather comprehensive information on the current energy consumption of vehicles. This audit helps identify the factors that influence the energy and power consumption of the vehicles. Conducting a vehicle audit is a crucial step toward improving energy efficiency and achieving better performance. It also serves as a means to analyze the types of fuels used and their environmental impact. Below are the details of the vehicles owned by YCCE, as well as those managed by staff and students.

Table No. 41: 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. 42: 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
Total		161	189

Table No. 43: CO2 emission of vehicle

Vehicles	Avg. Nos	Average CO₂ emission per vehicle/year (Ton)	Total CO₂ Emission per year (YCCE) (Ton)
Bike	189+250=439	0.6	263.4
Cars	161+40=201	4.6	924.6
Buses	20	4.6	92
Other Vehicles	05	4.6	23
Total			1303 Ton

12.0 Sound Audit

Sound is omnipresent in our environment, and its measurement plays a vital role in safeguarding our health, as excessive noise can be harmful. Prolonged exposure to loud noise can lead to hearing damage, and the risk depends on factors such as the noise level, proximity to the source, and duration of exposure. To assess sound levels, a device called a decibel meter is used, which samples and measures the intensity of sound. Decibel meters, also known as sound-level meters, can even be accessed through smartphone apps. Sound is measured in decibels (dB), and a 10-decibel increase corresponds to a sound being 10 times more intense. A Sound Level Meter (SLM) is typically a handheld instrument designed to measure sound levels in a standardized manner. Noise levels were assessed at various locations on the campus to identify areas with high noise pollution and quieter zones. This helps ensure that the sound levels comply with the recommended ranges during both day and night in the educational setting

.Image No. 23: Locations of Sound Component



Table No. 44: Sound Level Standard

CPCB Standards of Noise Levels					
Rural	Sub-Urban	Residential (Urban)	Urban (Residential & Business)	City	Industrial
25-35	30-40	35-45	40-50	45-50	50-60

Table No. 45: Noise Quality Standards

Noise level in Leq dB (A)			
S.N.	Area	Day Time	Night Time
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. 46: WHO Guidelines for Sound Level

Specific Environment	Time Base (hours)	Standards limits as per WHO guidelines	
		LAeq (dB)	L _{Amax} , 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 LAmax, fast), measured 100 mm from the car)

Table No. 47: Quantitative Characteristics of Noise Level at YCCE

Sr. No.	Locations	Noise level (Day Time)	Noise level (Night Time)
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) Encourage natural ventilation and illumination by alteration in the building structures whenever going for new constructions
- 3) Explore the feasibility of alternative fuels vehicles for staff & students (e.g., electric, hybrid, compressed natural gas) and advanced vehicle technologies.
- 4) Install motion sensor lights in rest of the buildings and less frequently used area to automatically turn off lights when no one is present.

13.0 Waste Audit: Institutional Municipal Solid Waste

Solid waste refers to a variety of discarded materials produced by human and animal activities that are deemed unwanted or useless. It is generated from industrial, residential, and commercial sectors within a specific area and can be managed in different ways. Landfills are typically classified based on the type of waste they handle, such as sanitary, municipal, construction and demolition, or industrial waste. Waste can be categorized by material type, including plastic, paper, glass, metal, and organic waste. It can also be classified by its potential hazard, such as radioactive, flammable, infectious, toxic, or non-toxic waste. Additionally, waste can be categorized according to its origin, whether from industrial, domestic, commercial, institutional, or construction and demolition sources. Regardless of its type or source, proper waste management is essential to ensure environmental sustainability and hygiene. Effective solid waste management should be incorporated into environmental planning. The Institutional Municipal Solid Waste (IMSW) data was calculated considering the number of individuals in each department and the time they spend there. The standard unit for Institutional Municipal Solid Waste (IMSW) is 0.147 kg per person per day.

Image No. 24: Institutional Municipal Solid Waste Pit



Image No. 25: Solid Waste pit at YCCE

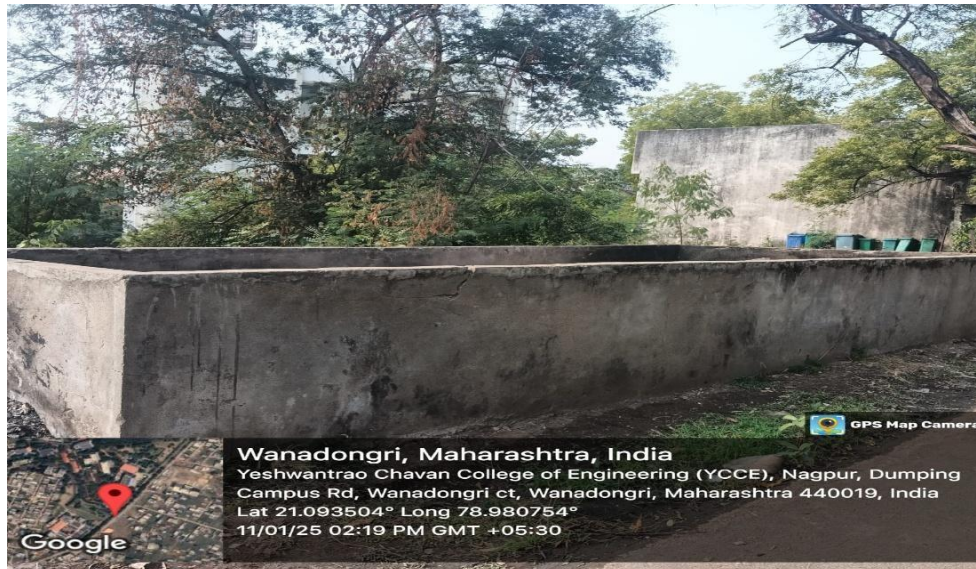


Table No. 48: Institutional Municipal Solid Waste Generation (IMSW) at YCCE

Sr. No	Name of Department	Total No of Students UG+PG	No of Individuals including faculty	No of Visitors	Solid waste generated per department (kg)/day
1)	Administrative Office	--	477	50	6672 x 0.147 = 980 Kg
2)	Library	--			
3)	Applied Science and Humanities	6145			
4)	Computer Technology				
5)	Electronics Engineering				
6)	Electronics & Telecommunication Engineering				
7)	Engineering				
8)	Electrical Engineering				
9)	Information Technology				
10)	Mechanical Engineering				
11)	Civil Engineering				

Henceforth,

Total Institutional Municipal Solid Waste (IMSW) = 980 kg generated at YCCE per day
Waste generated = 980 kg*365 days = 357986 kgs/yr

13.1 Institutional Municipal Solid Waste Management Plan

Developing an effective Institutional Municipal Solid Waste (MSW) Management Plan requires a holistic approach that takes into account waste generation, collection, transportation, processing, and disposal. Below are key components and recommendations for crafting a successful plan:

a. Waste Characterization

Conduct a detailed study to analyze the composition and quantity of various types of waste generated in the municipality, ensuring a better understanding of the waste stream.

b. Legal and Regulatory Framework

Ensure compliance with local, regional, and national waste management regulations. Develop policies and guidelines that align with existing regulatory frameworks to support effective waste management.

c. Institutional Structure

Establish a dedicated department or division focused on municipal solid waste management, responsible for the planning, implementation, and monitoring of waste management activities.

d. Public Awareness and Education

Implement public education campaigns to inform residents about proper waste disposal, recycling practices, and the importance of waste reduction.

e. Waste Collection

Design an efficient waste collection system, considering optimal collection frequencies, routes, and types of collection methods (e.g., curbside pickup, designated drop-off points). Incorporate separate collection streams for recyclables, organic waste, and non-recyclables.

f. Waste Transportation

Develop a transportation plan to ensure efficient and timely movement of waste from collection points to processing or disposal facilities, with a focus on using environmentally-friendly transportation methods where possible.

g. Waste Processing and Treatment

Establish or upgrade waste processing facilities, including composting plants, recycling centers, and waste-to-energy plants. Encourage private sector investment in innovative waste treatment technologies.

h. Landfill Management

Implement measures to minimize environmental impacts from landfills, such as leachate management, gas collection systems, and exploring options for landfill site remediation and eventual closure.

i. Waste Reduction and Recycling Programs

Promote waste reduction at the source and implement comprehensive recycling programs. Provide accessible facilities for both residents and businesses to participate in recycling efforts.

j. Monitoring and Reporting

Establish a monitoring and reporting system to track key performance indicators, including waste generation rates, collection efficiency, recycling rates, and overall waste management progress.

k. Technology Integration

Incorporate technology such as smart waste bins, GPS tracking for waste collection vehicles, and mobile apps to facilitate citizen engagement and optimize waste management processes.

l. Collaboration and Partnerships

Foster collaboration with local businesses, NGOs, and community organizations to strengthen waste management initiatives. Explore public-private partnerships to improve waste management services.

m. Emergency Response Plan

Develop a comprehensive emergency response plan to address unexpected situations, such as natural disasters or sudden surges in waste generation, ensuring readiness and effective action.

n. Budget and Funding

Create a sustainable financial model for waste management activities, incorporating user fees, grants, and potential partnerships to ensure continued operation and growth.

o. Periodic Review and Updating

Regularly review and update the waste management plan to stay aligned with evolving technologies, regulations, and local circumstances, ensuring the plan remains relevant and effective.

13.2 E-Waste Management

E-waste refers to consumer and business electronic devices that are nearing or have reached the end of their useful life. Though it accounts for only about 5% of global municipal solid waste, e-waste is significantly more hazardous than other types due to the presence of harmful substances such as cadmium, lead, mercury, and Polychlorinated Biphenyls (PCBs), which can pose serious risks to human health and the environment. At the campus, the quantity of e-waste generated is minimal. Laser printer cartridges are refilled off-campus, and the administration conducts awareness programs in collaboration with various departments to educate staff and students about the importance of e-waste management. Defective electronic items, such as those from the computer laboratory, are properly stored. To ensure responsible disposal, the institution has decided to partner with an approved e-waste management and disposal facility that will handle the e-waste in a scientifically safe manner.

14.0 Waste Audit- Municipal Sewage

Wastewater, also known as sewage, is the byproduct of various water uses such as showering, dishwashing, laundry, and toilet flushing. The wastewater is transported via a sewer or collection system designed to direct it to a centralized treatment facility. The collection system consists of smaller sewers, typically around four inches in diameter. It is essential to remove pollutants from wastewater to protect the environment and public health. When water is used, it becomes contaminated with pollutants that, if left untreated, can severely impact the water environment. For instance, organic matter can deplete oxygen levels in lakes, rivers, and streams, and untreated wastewater can contribute to waterborne diseases. Sewerage refers to the infrastructure that carries sewage or stormwater through sewers. It includes components such as receiving drains, manholes, pumping stations, storm overflows, and screening chambers, all of which convey wastewater to the treatment plant or to discharge points in the environment. The YCCE campus is equipped with its own Sewage Treatment Plant (STP), which has a capacity of 125,000 liters per day (LPD). The treated water is regenerated for use in gardening, washing, and flushing. The campus has a combined and efficient wastewater collection system that connects all departments and administrative buildings for wastewater conveyance. The STP is strategically located downhill to take advantage of gravity, ensuring the efficient flow of wastewater to the treatment plant.

The STP includes the following treatment processes:

1. Primary Treatment
2. Secondary Treatment
3. Tertiary Treatment

Image No. 26: Location of Sewage Treatment Plant



Image No. 27: Sewage Treatment Plant Design and Description

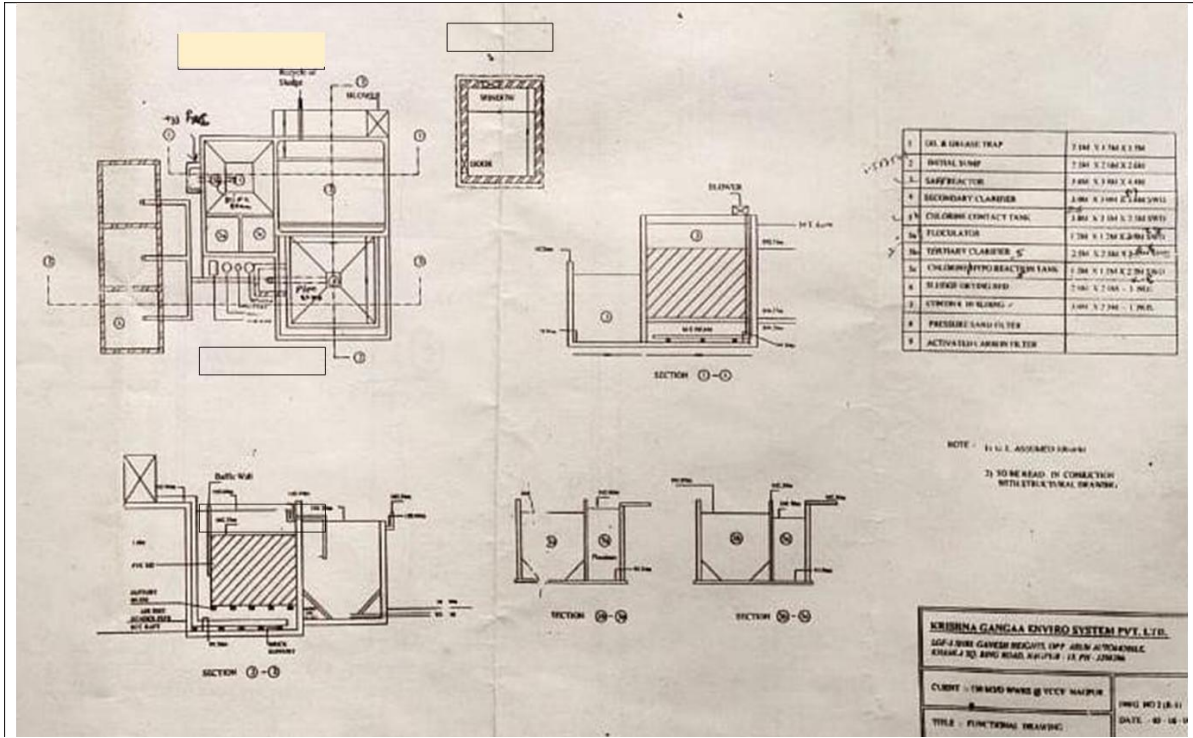


Image No. 28: Sewer Line Drainage Map

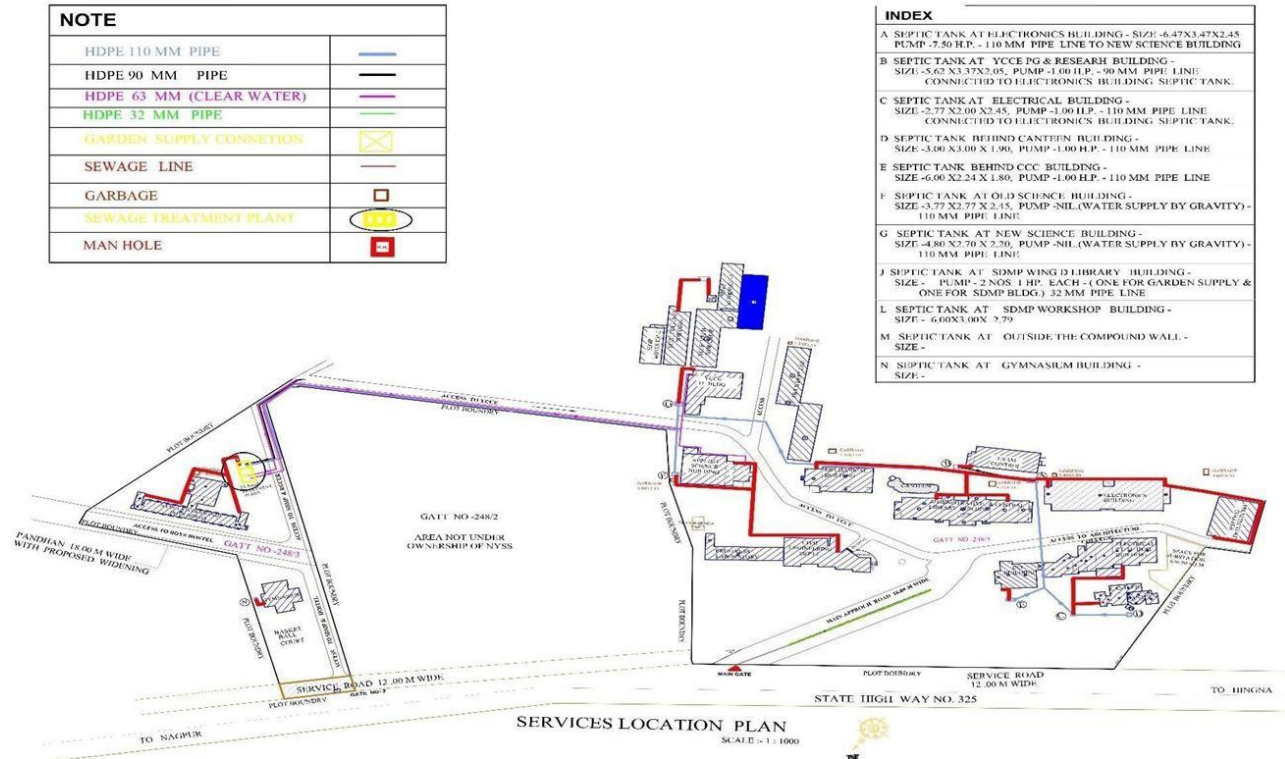


Image No. 29: Layout Plan of Sewage Treatment Plant

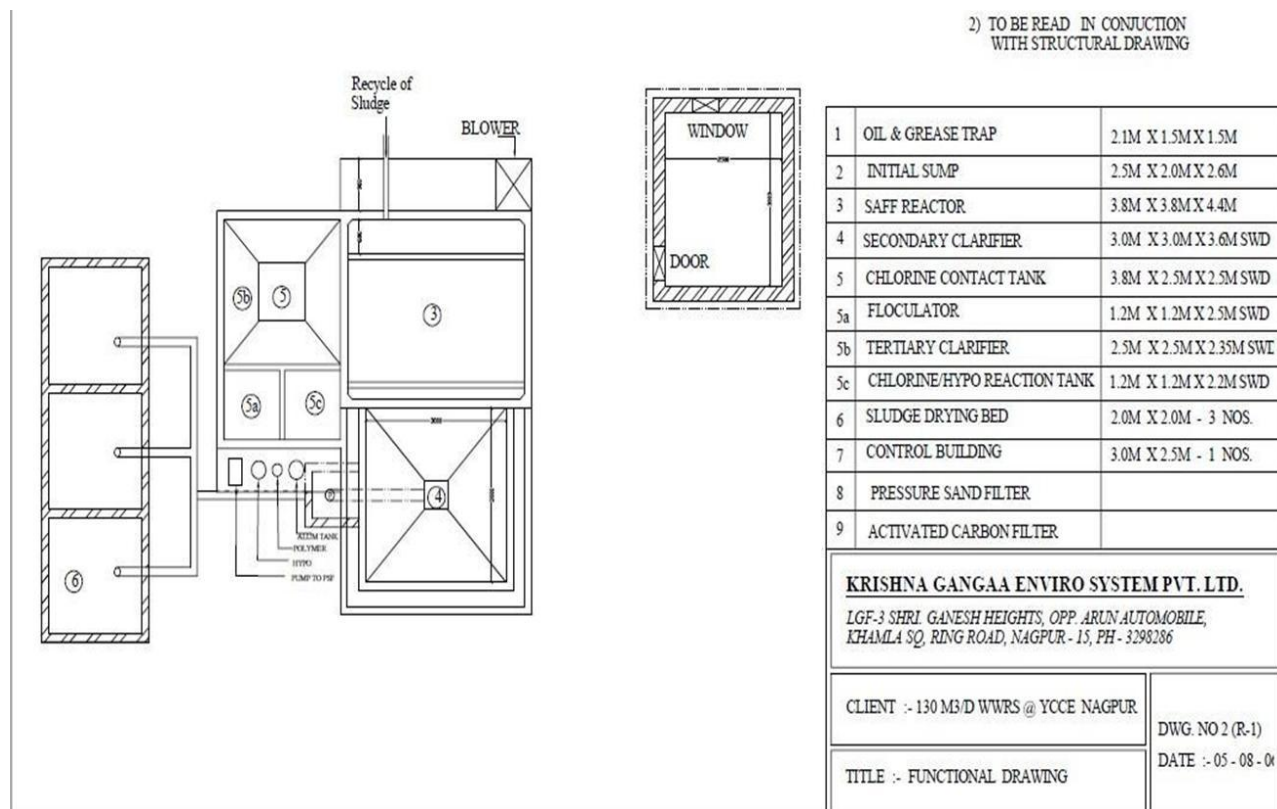


Table No. 49: Sewage Standards

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 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	20-30
3)	Total Suspended Solids (TSS)	Same as above [(2)-BOD]	50-100
4)	Fecal Coliform (FC) (Most Probable Number per 100ml, MPN/100ml)	Anywhere in the country	<1000

Table No. 50: 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 rd Ed. 2017, 4500- H ⁺ - 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 rd Ed. 2017, 2500- D, 2-70
4)	Chlorides (as Cl ⁻)	mg/L	44	48	–	APHA 23 rd Ed. 2017, 4500-Cl- B, 4-75
5)	Sulphates (as SO ₄)	mg/L	42.6	56.4	–	APHA 23 rd Ed. 2017, 4500- SO ₄ -E,4-199
6)	Dissolved Oxygen	mg/L	4.1	6	–	APHA 23 rd Ed. 2017,4500- ,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 rd 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. 51: Qualitative & Quantitative Parameters of Recycle Water Source at YCCE

Sr. No	Characteristics Parameters	Values
1)	Odor	Agreeable
2)	Color	<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 ₃)	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



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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	:-
Date of Receipt	: 27-Oct-23	Start Date of Analysis	: 28-Oct-23
		Quantity submitted	: APP.5 LTR
		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 58) (L.L.Q. : 1mg/l)	mg/l	41.2
2	BIOCHEMICAL OXYGEN DEMAND (3 days) at 27 °C Method : IS 3025 (part 44) (L.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 Bhore
Shital Bhore

Ashwini Gada
Ashwini Gada

Image No. 32: Sample Report of Waste water testing



QUALICHEM LABORATORIES

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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 COLLAGE 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 : -
 Date of Expiry : -
 Date of receipt : 27-Oct-23
 Batch No : -
 Batch Size : -
 Start Date of Analysis : 28-Oct-23
 Quantity submitted : APP.5 LTR
 Completion Date of Analysis : 3-Nov-23
 Discipline : CHEM-BIO
 Description : POLLUTION & ENVIRONMENT
 Group : POLLUTION & ENVIRONMENT

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	FECAL COLIFORMS Method : APHA	/100ml	Present

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 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.
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Ashwini Gode
Ashwini Gode

15.0 Waste Audit- Sanitation Utilities

Rapid population growth, urbanization, climate change, pollution, and inadequate funding are creating unprecedented challenges in providing water and sanitation services. To effectively address these challenges, improving and managing universal access to water and sanitation in a holistic manner is crucial for achieving the Sustainable Development Goals and meeting the needs of millions globally. This effort must consider social, economic, and environmental factors while also adapting to the risks posed by climate change to ensure the resilience of water and sanitation systems. As of 2020, 54% of the global population (4.2 billion people) had access to safely managed sanitation services. Additionally, 34% (2.6 billion people) used private sanitation facilities connected to sewers with wastewater treatment, 20% (1.6 billion people) had toilets or latrines where excreta were safely disposed of in situ, and 78% (6.1 billion people) used at least a basic sanitation service.

The benefits of improved sanitation go beyond reducing the risk of diarrheal diseases. These benefits include:

- Reducing the spread of neglected tropical diseases like intestinal worms, schistosomiasis, and trachoma, which cause significant suffering.
- Alleviating malnutrition by improving overall hygiene.
- Promoting dignity and enhancing safety, especially for women and girls.
- Increasing school attendance, particularly for girls, by providing separate sanitary facilities.
- Reducing the spread of antimicrobial resistance.
- Offering the potential to recover water, renewable energy, and nutrients from fecal waste.
- Helping mitigate water scarcity by safely using wastewater for irrigation, particularly in areas most affected by climate change.

Table No. 52: 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	1	1	3	1	0	1	1	1	1	0
		1st Floor	1	0	0	1	2	0	2	0	2	0
		2nd Floor	1	2	3	0	0	2	0	2	0	0
		3rd Floor	1	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	1	0	0	2	2	0	2	0	2	1
		2nd Floor	1	2	8	0	0	2	0	2	0	0
		3rd Floor	1	0	4	2	0	1	1	2	2	0
	Civil	Ground Floor	1	1	6	1	0	2	1	3	1	1

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

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) Unused food waste to be used as cattle feed, or feed into anaerobic reactor.
- 4) Biodegradable waste to be compost in the college premises in technical manner
- 5) Set up dedicated paper recycling bins across the campus and partner with local recycling units.
- 6) Garden waste should be degraded in windrow composting plants instead of burning.

16.0 Fire and Safety Audit

Fire safety encompasses a set of practices aimed at minimizing the damage caused by fire. These measures focus on preventing the ignition of uncontrolled fires and limiting their spread and impact once they occur. Fire safety protocols are incorporated during the construction of buildings and can also be implemented in existing structures. Additionally, fire safety education is provided to building occupants to ensure preparedness in the event of a fire. Fire hazards, which refer to potential threats to fire safety, are situations that increase the likelihood of a fire or obstruct escape during an emergency. Fire safety is typically integrated into overall building safety regulations. Fire department personnel, specifically Fire Prevention Officers, are responsible for inspecting buildings to ensure compliance with fire codes and educating the public, including school children, about fire safety. The Chief Fire Prevention Officer leads the Fire Prevention Division, often training new officers, conducting inspections, and delivering presentations on fire safety topics.

Table No. 53: Building-wise Availability of Fire Safety Systems

Sr. No.	Buildings / Unit	Fire System Availability
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

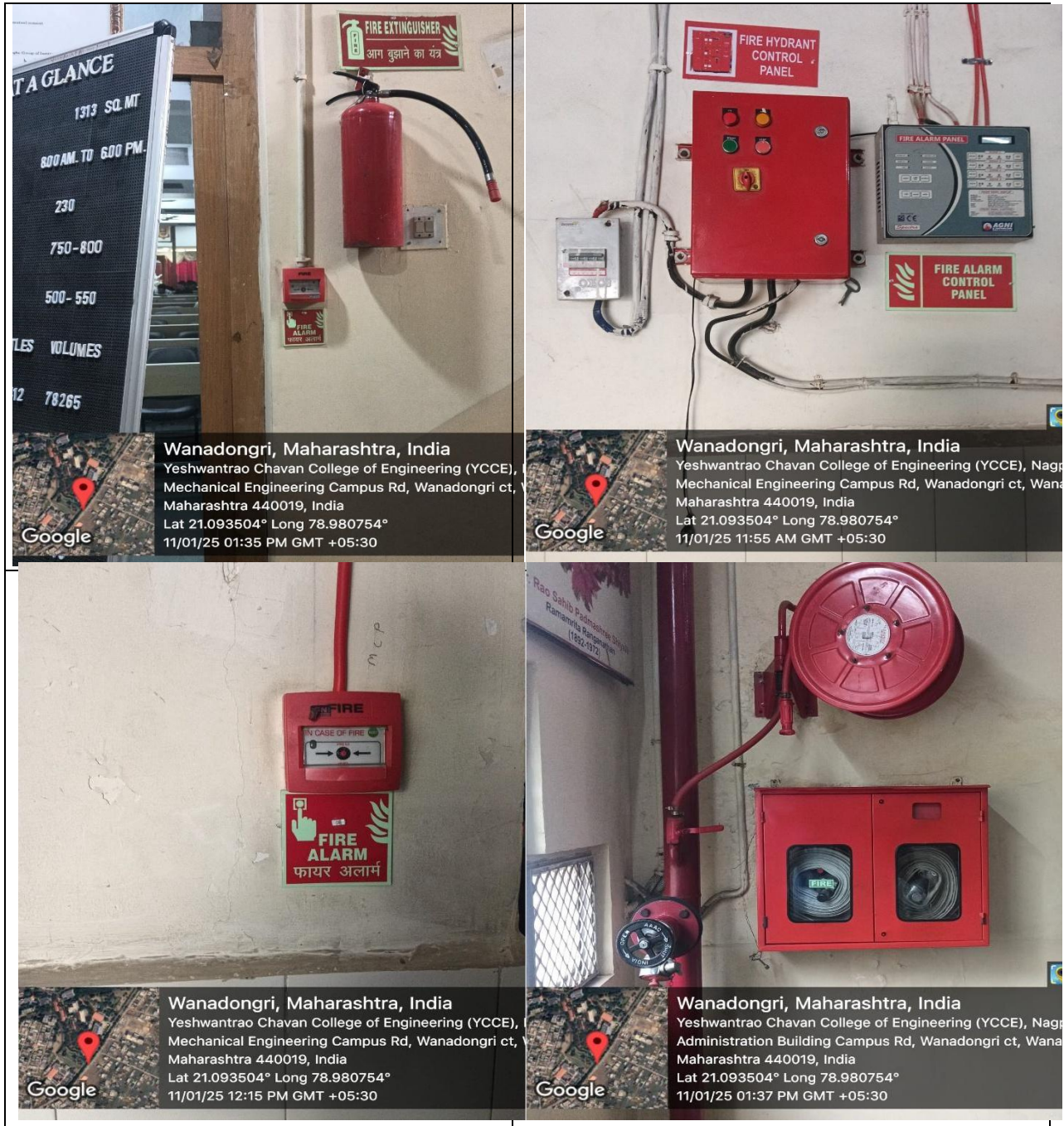


Table No. 54: Fire Safety Details of CCC Building

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
		Co2 type	Yes	05 Nos.	Yes	Ok(Due 18/09/2024 & (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. 55: 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(Due18/09/2024)&(02/10/2024)
		Co2type	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. 56: 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.		Specification/ Details	Availability	Capacity	Status as on	

No	Description		(Yes /No)	/Quantity/No's	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)
		Co2type	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. 57: 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
4	Fire Detection& Alarm system	Two Way	Yes	1 Nos.	Yes	Working
		Four Way	No	NA	NA	NA
		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. 58: 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 Working
		Fire pump Panel	Yes	1 Nos.	Yes	Working, Oiling & greasing
		Hydrant valve	Yes	4 Nos.	Yes	Working
		Hose Reel	Yes	3 Nos.	Yes	present
		Hose Box	Yes	4 Nos.	Yes	NA
		Sprinklers	No	No	No	Present in Hose Box
		RRL Hose Pipe	Yes	08 Nos.	Yes	Present in Hose Box
		Branch pipe	Yes	04 Nos.	Yes	Working
		Two Way	Yes	1 Nos.	Yes	NA
		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. 59: 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	Remarks

					the Working	
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. 60: 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. 61: 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. 62: 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)
		Co2type	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. 63: 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. 64: 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. 65: 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.		Specification/ Details	Availability	Capacity	Status as on	

No	Description		(Yes /No)	/Quantity/No's	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	
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Table No. 66: 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.
- 7) Clearly display fire exit signs and ensure they are illuminated and unobstructed.
- 8) Train staff and students in fire safety protocols, including:
 - How to use fire extinguishers.
 - Emergency evacuation procedures.
 - Fire prevention tips.
- 9) Regular inspection of electrical wiring and appliances.
- 10) Avoid overloading circuits and using damaged electrical equipment.
- 11) Ban open flames, smoking, and unauthorized use of flammable substances on campus.
- 12) Properly store chemicals in labs following safety guidelines.
- 13) Have a communication system in place to quickly notify everyone of a fire.
- 14) Test fire alarms, smoke detectors, and sprinklers regularly

17.0 Green Initiatives/ Activities in Campus

1. Feedofest

On the occasion of World Environment Day, the NSS unit of YCCE organized Feedofest 2.0 - Aviofest. During this event, volunteers took the initiative to care for and feed stray animals and birds in their vicinity, despite the challenging circumstances. The goal was not only to protect these creatures but also to inspire volunteers to spread love and raise awareness about the importance of caring for them.



2. Tree Plantation Drive

The NSS unit of YCCE, under the Unnat Bharat Abhiyan, organizes an annual Tree Plantation Drive. The primary goal of this initiative is to raise awareness about the significance of trees, emphasize their importance, and encourage people to plant more trees while ensuring their proper care. The drive commenced in Raipur Village, followed by Degma Budruk Village and Degma Khurd Village. The event was inaugurated with the planting of a sapling by the Sarpanch of the villages, accompanied by YCCE faculty members. The NSS unit successfully planted over 100 saplings, and the event received tremendous appreciation from the villagers and the Sarpanch. The core committee expressed gratitude to all the volunteers for their active participation and commitment to the success of the event.





3. Cleanliness Drive

The NSS unit of YCCE successfully organized a Cleanliness Drive at Variety Square, Sitabuldi, Nagpur. The primary objective of this initiative was to clean the surrounding area to reduce the risk of disease and to raise awareness about the importance of maintaining cleanliness in one's environment. With the active participation of over 100 volunteers and faculty members, the NSS unit collected more than 80 kg of garbage, making the drive a significant step toward promoting hygiene and environmental responsibility.



18.0 Overall Recommendations

- **Quantification and Characterization of Laboratory Wastewater**

The volumetric flow rate and physicochemical characteristics of laboratory wastewater should be systematically measured and analyzed. The effluent must be directed to a designated treatment system in compliance with regulatory standards.

- **Implementation of Solid Waste Segregation Protocols**

Proper segregation of solid waste at the source should be ensured before final disposal, follow waste management guidelines to facilitate recycling, treatment, or safe disposal.

- **Biodegradable Waste Management via Aerobic and Anaerobic Digestion**

Organic waste should be processed through aerobic composting or anaerobic digestion to generate compost, biogas, or other useful byproducts, enhancing resource recovery and waste minimization.

- **Development of a Green Belt Plan**

A structured plan for green belt development should be formulated, incorporating native species selection, biodiversity enhancement, and carbon sequestration strategies to mitigate environmental impacts.

- **Implementation of Rainwater Harvesting (RWH) Systems**

All buildings within the campus should integrate rainwater harvesting systems to enhance groundwater recharge and reduce dependency on external water sources, following hydrological and structural feasibility assessments.

- **Annual Departmental Electrical Load Assessment**

A systematic audit of electricity consumption at the department level should be conducted annually to identify energy usage trends, optimize efficiency, and implement conservation measures.

- **Deployment of Water-Efficient Technologies**

Water-saving techniques, such as automation systems, sensor-based appliances, and low-flow fixtures, should be adopted to optimize water usage and minimize wastage.

- **Sanitary Waste Disposal**

The disposal of sanitary napkins should be carried out in adherence to the Biomedical Waste Management Rules, ensuring the use of appropriate incineration, composting, or safe landfill methods.

- **Biodiversity Conservation and Artificial Nesting**

Tree plantation drives should be conducted to enhance ecological balance, and artificial nesting structures should be installed to support avian biodiversity and urban wildlife.