Green Audit 2019 - 21

AUDIT REPORT

Studied for

Khandesh College Education Society's

Institute of Management and Research

IMR Campus, Behind DIC Office Jalgaon - 425001

Analysed by

Greenvio Solutions

20 October 2021

Background reference image Nic Y C Gua on unsplash

Disclaimer

Green Audit Team has prepared this report for **Khandesh College Education Society's Institute of Management and Research, IMR Campus, Behind DIC Office, Jalgaon - 425001** based on input data submitted by the College analysed by the team to the best of their abilities.

The details have been consolidated and thoroughly studied as per the various guidelines for Green Buildings available in National Standards, the report has thereby been generated based on comparative analysis of the existing facilities and the benchmarks. The suggestions derived as a result of the inspection and research as per inputs which would further enhance and develop a Healthy and Sustainable Institution.

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

The audit is a thorough study based on the inventory and on-site investigation of data collected over a period of time and should not be used for any legal action. This is the property of Greenvio Solutions and should not be copied.

The Report is prepared by the Team of Greenvio Solutions under their brand and department – Sustainable Academe as Consultancy firm along with Ar. Nahida Shaikh as an Accredited Green Building Professional.

Greenvio Solutions

Developing Healthy and Sustainable Environments

We are an Environmental and Architectural Design Consultancy firm

Sustainable Academe is our department for conducting Audits

Palghar District, Maharashtra- 401208

sustainableacademe@gmail.com

Acknowledgement

Green Audit Assessment Team thanks the **Khandesh College Education Society's Institute of Management and Research, Jalgaon** for assigning this important work of Green Audit. We appreciate the cooperation extended to our team during the entire process.

Our special thanks are due to **Hon. Nandkumar Gopalrao Bendale,** President; **Adv. Prakash Bhaskar Patil,** Vice President; **Hon. Suresh Ramkrishna Chirmade,** Treasurer; **Adv. Sitaram Shrawan Phalak, Secretary** and **Adv. Pramod Ninu Patil,** Joint Secretary and everyone from the Management.

Our heartfelt thanks to Principal and Chairman of the entire process **Prof. Dr. Shilpa Bendale,** Director; **Mrs. Tanuja Fegade,** Academic Dean and **Mr. M. R. Waykole,** OS for the valuable inputs.

We are also thankful to College's Task force the faculty members who have collected data required for green audit **Asst. Prof. Mr. Samadhan Bundhe** and **Asst. Prof. Dr. Yogesh Patil** and **Mr. Vijay Patil,** Clerk for the inventory and data collection.

We highly appreciate the assistance of **Mr. Samadhan Mali** and **Mr. Arbaj Sheikh** for their support while collecting the data.

Sustainable Academe

Brand of Greenvio Solutions, Palghar District, Maharashtra- 401208

Contents

1. Introduction 4
2. Institution overview 7
3. Green Audit 13
4. Ecological (Environmental) Audit 14
5. Waste Audit.....25
6. Water Audit 28
7. Energy Audit.....32
8. Towards a Healthy & Sustainable Institution 46
9. References 47
10. Annexure.....49


K.C.E.Society's
Institute of Management & Research


IMR BUILDING EASTSIDE VIEW


IMR BACKSIDE

1. Introduction

1.1 About Khandesh College Education Society

It was formed in 1946 by the visionary man Annasaheb Dr. G.D. Bendale, under the flagship of KCE Society. Many renowned institutions are administering by KCE group; of which M. J. College is awarded as a 'College with Excellence" by NAAC committee. This is the most prestigious award as only the best 10 colleges of India count amongst this list.

1.2 Vision and Mission Statement of College

Our Vision - Committed to provide value based, quality, professional and technical education to the students and empowering them with the required skillsets and competencies to face challenges of the fast changing global environment.

Our Mission

- To provide necessary technical and professional education with a view to uplifting the lives of rural and urban students.
- To create a conducive platform for students to develop their skills and knowledge.
- To encourage innovation and research aptitude among students.
- To inculcate global ethics and human values in all the learners.

1.3 Institution in the premise

The First Management Institute of North Maharashtra University is situated in the prime location of Jalgaon (amidst a rural setting) with close proximity recreational and amenities such Hospital, Fire Station and much more. During the entire day schedule with smooth transition of internal student traffic management which is highly commendable.

It was established in 1986 with single building, over the time it has grown into an four-storied structure. The objective of college is to providing quality education to enhance employability skills through innovation and persistence.

The aim of the college is to continuously enhance the teaching methods in order to

provide students with an opportunity for their all-round development. It also strives for excellence in academics and makes an effort to induce passion for learning along with the inspiration for decisive thinking and assessment, thereby helping them to become the best professionals in their chosen careers.

The institution offers the following courses affiliated to Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon.

- Graduation - B.B.A, B.C.A (Three Years as Semester Pattern)
- Post-Graduation – I.M.B.A. and I.M.C.A. (Two Years as Semester Pattern).

The various departments in the Institution are as follows:

- Department of Computer Science
- Department of Management

The College aims at training young women and men to be competent, committed and compassionate, and lead in all walks of life.

1.4 Assessment of the College

University - The institution is affiliated to Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon.

NAAC - The following are details of the reaccreditation of the Khandesh College Education Society's Institute of Management and Research.

- Cycle – First Cycle
- Grade – B Grade
- CGPA – 2.39
- Year of application – 2018

ISO – The College is ISO 9000:2015 (Quality Management System) Certified by SP Certification Limited, London in 2019-20

1.5 Achievements of the College

The college has a tremendous track record of excellence in Built form and educational services provided, below are some of the achievements of the prestigious Institute.

- **Certificate of Qualification for Microsoft Edu-Cloud Program** by

Microsoft Corporation India Private Limited (2020-21)

- **Excellence Award** by Sakal Media Group (2021)
- **Participation Award to the Institute** by makeintern (IIM-K and Unmaad organised award and contest) (2020)
- **Most promising Business School of the year** in Maharashtra by Reginup Research Intelligence Private Limited (2020)
- **Awarded to Director for exemplary contributions in the area of Educational Leadership and Management** by ILDC-AMP (2019)
- **Participation Award to the Institute** by makeintern (IIM-K organised award and contest) (2019)
- **Exemplary Academic Leader of the Year to Director** by CEGR (2019)

2. Institution overview

2.1 Populace analysis

2.1.1 Academic year 2020-21

2.1.1.1 Students data

The student data (shared by the College) shows in 2020-21 there are total of **1,626** students occupying the premises.

2.1.1.2 Staff data

The staff data shows the premise has a total of **62** staff members out of these there are **50** Teaching staff, **5** Non-teaching staff and **7** Administrative staff members in the premise.

2.1.1.3 Gender analysis

There was a total of **1,488** populace occupying the premise.

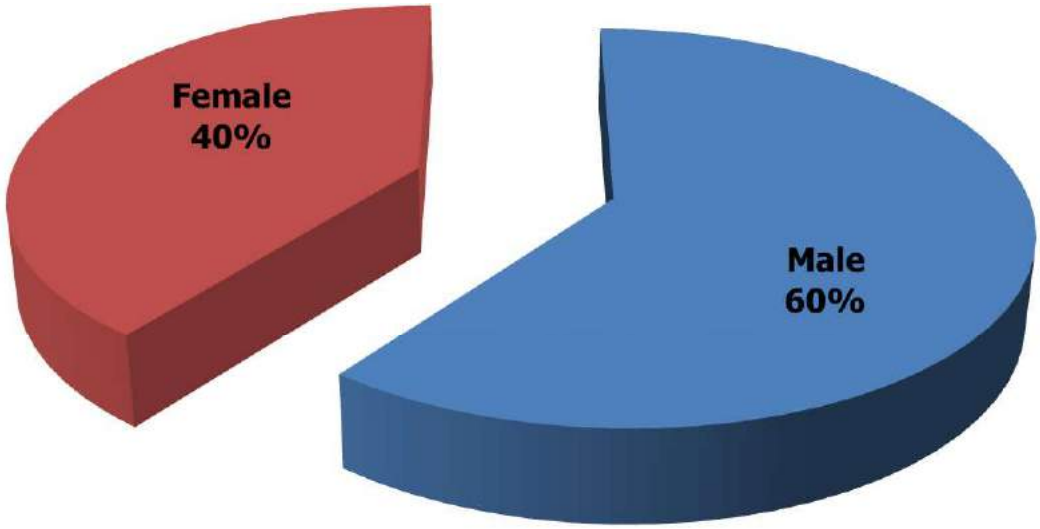


Figure 1: Population study for 2020-21

The above study shows there were **60% of Male occupants** as compared to **40% of Female occupants** in 2020-21.

2.1.2 Academic year 2019-20

2.1.2.1 Students data

The student data (shared by the College) shows in 2019-20 there are total of **1,252** students occupying the premises.

2.1.2.2 Staff data

The staff data shows the premise has a total of **62** staff members out of these there are **50** Teaching staff, **5** Non-teaching staff and **7** Administrative staff members in the premise.

2.1.2.3 Gender analysis

There was a total of **1,314 populace** occupying the premise.

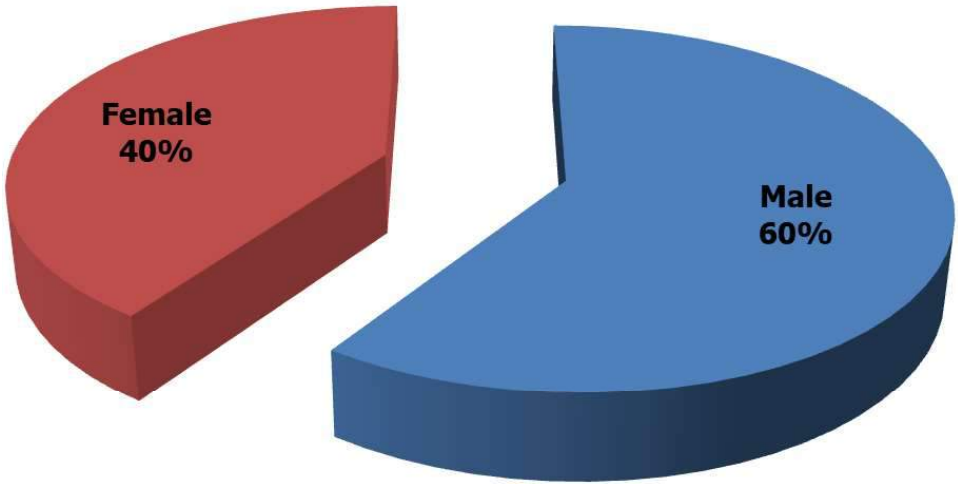


Figure 2: Population study for 2020-21

The above study shows there were **60% of Male occupants** as compared to **40% of Female occupants** in 2019-20.

2.2 Site analysis

The following listed are some of the positive site elements which are beneficial to the college in terms of tangible and intangible benefits.

- **Location -** The Khandesh College Education Society's Institute of Management and Research, IMR Campus, Behind DIC Office, Jalgaon – 425001. It is situated amidst the semi-urban scenario and is adjacent to the main approach road.
- **Neighbourhood context -** The premise is surrounding by mix of Residential and Commercial (Small shops) on the immediate surroundings of the site. The premise is situated in Jalgaon.
- **Natural physical features –** Though situated amidst the urban centre, the college has made efforts to include plantation as part of its immediate site access.

- **Manmade features –** The premise is situated in an urban area with close proximity to all necessary amenities. The materials used for construction are RCC and the landscaping includes natural trees as well as potted plants.
- **Circulation –** There is a smooth transition of pedestrian traffic inside the premises due to the large entrance gate and the huge open space where vehicles of students and staff is parked.
- **Climate –** Jalgaon's climate is classified as tropical. The summers here have a good deal of rainfall, while the winters have very little. The climate here is classified as Aw by the Köppen-Geiger system. The average annual temperature is 26.7 °C | 80.1 °F in Jalgaon. The annual rainfall is 833 mm | 32.8 inch.

(Source: https://en.climate-data.org/asia/india/maharashtra/jalgaon-5808/)

2.3 Total Institute Area & College Building Spread Area

The total site area is 1.2 acres and total built-up area is 86,537 sq. ft. for approx. 1,314 footfalls.

2.4 Institute Infrastructure

2.4.1 Establishment

The building was established in 1986. The Building is a Reinforced Cement Concrete (RCC) framework building. **Overall the Infrastructure of the Building is excellent in terms of the Architecture Design and Green Building Design. The Premise covers quite a few of the requirements for a Green Habitat.**

2.4.2 Spatial Organisation

The overall ambience of the College is warm and inviting. The classrooms and other spaces have ample natural ventilation in the form of clear glass windows with fresh air ventilation. The architecture of the building is quite well designed. The colour palette not just helps the building to stand out but also provides an Institutional arena. It balances with the local architecture with the natural landscapes of huge coconut trees all around. The design emphasis on providing calmness to the built form and gradually merges with the serene landscape.

There are no false ceilings in the campus. The floor to floor height is 5 meter which is

quite phenomenal in terms of volume w.r.t. to human scale. This provides feeling of grandeur and spaciousness. There are no lifts in the premise. There are provisions for CCTV in addition to amenities such as library. There is 1 meter for college buildings. The room-wise details are mentioned below:

S. No	Room Name	Floor
1	Placement	Stilt Floor
2	Classroom	Stilt Floor
3	Classroom	Stilt Floor
4	Electrical Room	Stilt Floor
5	Lab I	Stilt Floor
6	Lab II	Stilt Floor
7	Lab III	Stilt Floor
8	Lab IV	Stilt Floor
9	Store Room	Stilt Floor
10	Lab VII	Stilt Floor
11	Lab VI	Stilt Floor
12	Lab V	Stilt Floor
13	HOD Cabin	Stilt Floor
14	Admin Office	Ground Floor
15	Director Office	Ground Floor
16	Admin Office	Ground Floor
17	Admin Office	Ground Floor
18	HOD Cabin	Ground Floor
19	Conference	Ground Floor
20	Boys Common Room	Ground Floor
21	First Aid Seekroom	Ground Floor
22	Store Maintenance, House Keeping	Ground Floor
23	Gents Toilet	Ground Floor
24	Ladies Toilet	Ground Floor
25	Girls Common Room	Ground Floor
26	Auditorium Hall	Ground Floor
27	Exam Control Office, Reprography	Ground Floor
28	Library	First Floor
29	Library	First Floor
30	Reading Room	First Floor
31	Tutorial 1, Tutorial 2 MCA	First Floor

32	Faculty Room MCA	First Floor
33	Classroom MCA	First Floor
34	Classroom MCA	First Floor
35	Classroom MCA	First Floor
36	Gents Toilet	First Floor
37	Ladies Toilet	First Floor
38	Classroom MCA	First Floor
39	Computer Center MCA	First Floor
40	Room	First Floor
41	Classroom MBA	Second Floor
42	Classroom MBA	Second Floor
43	Classroom MBA	Second Floor
44	Tutorial 1 MBA	Second Floor
45	Tutorial 2 MBA	Second Floor
46	Faculty Room MBA	Second Floor
47	Classroom MBA	Second Floor
48	Classroom MBA	Second Floor
49	Classroom MBA	Second Floor
50	Classroom MBA	Second Floor
51	Gents Toilet	Second Floor
52	Ladies Toilet	Second Floor
53	Classroom MBA	Second Floor
54	Seminar Hall MBA	Second Floor
55	Classroom IMBA	Third Floor
56	Classroom IMBA	Third Floor
57	Classroom IMBA	Third Floor
58	Classroom IMBA	Third Floor
59	Faculty Room IMBA/IMCA	Third Floor
60	Classroom IMCA	Third Floor
61	Classroom IMCA	Third Floor
62	Classroom IMCA	Third Floor
63	Classroom IMCA	Third Floor
64	Gents Toilet	Third Floor
65	Ladies Toilet	Third Floor
66	Classroom IMCA	Third Floor
67	Seminar Hall MCA	Third Floor

Table 1: Room-wise space details

2.4.3 Fire Safety

When the building was constructed Fire fighting norms and permission from Chief Fire Officer was not in practice. However, the Institution has taken care for adequate fire safety measures to be adopted. Each floor has an open staircase without any barriers for fire safety measures. These staircases are free of any kind of storage or combustible material. The windows in each classroom are at a low height with fresh air and natural light thereby adding to ample ventilation throughout the day. The college should adopt additional fire safety practices such as fire hydrant and others.

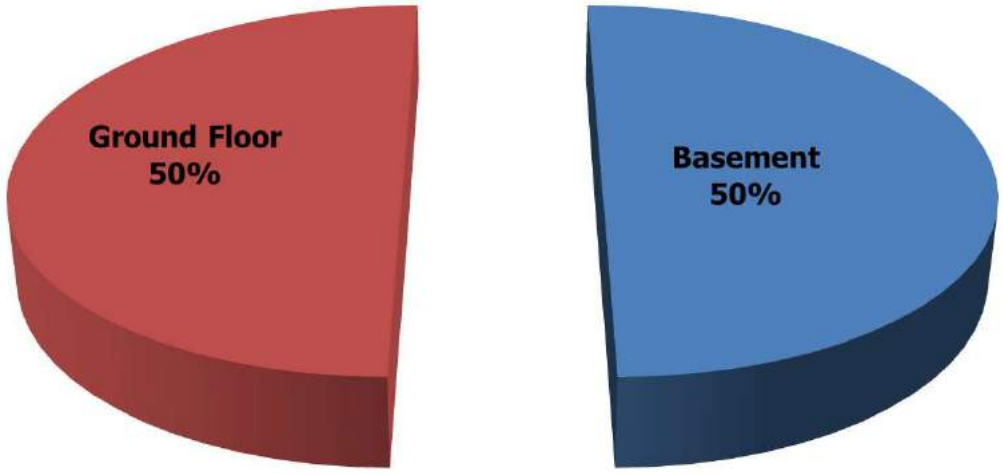


Figure 3: Summary of the fire-extinguishers in premises

The current facilities are quite well maintained. There are total of 4 fire extinguishers which have not expired.

2.4.4 Operation and Maintenance of the premises

The interview session with the staff regarding the operation and working hours is summarised in the table. The Institutions are open Monday to Saturday for full day. Sunday is an off for all.

S. No.	Section	Spaces	Time	Hours / day	Days in a year
1	Main Institutional College	Student areas and Teaching faculty	7:30 a.m. to 1:30 p.m.	6	180
2	General areas	Admin areas and library, Passage, lift, staircase, toilet, Trust office, Outdoor Compound lights, Outdoor - Pumps	10:00 a.m. to 6 p.m.	8	225

Table 2: Schedule of the timings of the premises

The various awards received by IMR, Khandesh

Award Certificate

This is to certify that

Prof. Shilpa Kiran Bendale

is awarded with

Exemplary Academic Leader of the Year 2019

Award for his/her outstanding and exemplary contribution towards Education, Skill Development and Research on 19th December, 2019 (Thursday) in Royal Ball Room, The Eros, Nehru Place, New Delhi During 12th Rashtriya Shiksha Gaurav Puraskar Ceremony

BEST AWARD

Ravish Roshan
Director
CEGR

A. P. Mittal
President, CEGR and
Former Member Secretary, AICTE

EDU-CLOUD

Microsoft

Certificate of Participation

This is to certify that

Khandesh College Education Societys Institute of Management & Research

has successfully qualified for

Microsoft EDU-CLOUD Program

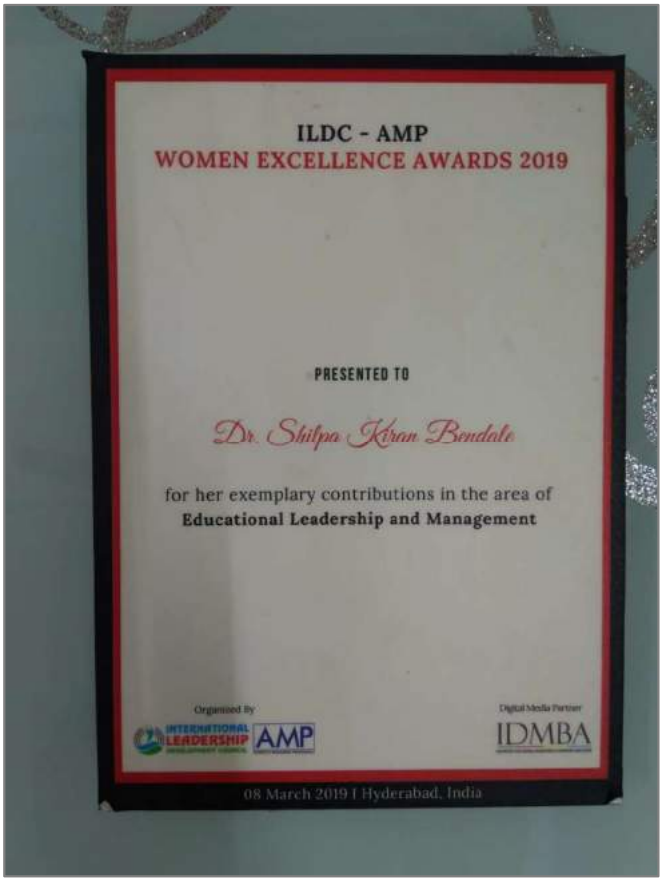
for the period **23rd Dec'2020 to 22nd Dec'2021**

This certificate is awarded as a recognition of true spirit and leadership demonstrated.

Omjiwan Gupta
Director (Education)

Microsoft Corporation India Private Limited

The various awards received by IMR, Khandesh



The various awards received by IMR, Khandesh

3. Green Audit

3.1 About the Green Audit

It is a systematic study of the aspects which make the Institution a sustainable and healthy premise for its inhabitants.

3.2 Analysis for the Green Audit

The procedure included detailed verification for the following:

Energy Audit

- Analysis of the Lights, Fans, AC, Equipment
- Renewable energy
- Scope for reducing the current energy bills if any
- Improvement in the thermal comfort of the campus

Water Audit

- Analysis of the current water consumption of campus
- Scope to include Rain water harvesting and Waste water treatment in campus

Waste Audit

- Current waste produced, its segregation and usage
- Strategies to be adopted for waste management and awareness

Environmental Audit

- Analysis of the current landscape + hardscape of campus
- Analysis of the flora and fauna of campus
- Strategies adopted at present to enhance vegetation
- Measures that can be adopted for ecological improvement of campus

3.3 Strategy adopted for conducting Green Audit

The strategies included data collection from admin department, actual inventory, investigation to check the operation and maintenance, analysis of the data collected and preparation of the Report.

3.4 Timeline of the activities for Green Audit

- 28 May 2021 – Discussion with the College
- 9 June 2021 – Initiation by the College to conduct Audit
- 30 July 2021 – Data submitted by College
- 6 August 2021 – Survey of the Student and staff submitted
- 18 August 2021 – Submission of draft Report
- 20 October 2021 – Submission of Main Report

Ecological (Environment) Audit

Background reference image Yugal Shrivastava on pexels

Greenvio Solutions

4. Ecological (Environmental) Audit

Environment is an essential part for human survival. We co-exist with the environment and it cannot be termed as a separate entity. The Ecological audit helps to understand the flora, fauna that exists and steps that can be taken to improve the same. To denote if there are problems related to sound in and around the surrounding. In terms of the carbon footprint it helps in keeping a tab on the eco-friendly habits incorporated by the inhabitants of the premise. Health today is the topmost priority, a general understanding of the initiatives undertaken along with sufficient hygiene practices adopted. Universal design is applicable to all built and unbuilt spaces. The premise needs to have facilities for students who are specially abled alike.

As part of our study we could state that the Institution has developed eco-friendly practices and sustainable solutions which are well reflected in the rich biodiversity of the Premises. Being situated near the city the appreciation space towards the main entrance provides a welcoming approach to the College.

4.1 Open Spaces

There is provision of open space in premise (Around 5,380 sq. ft. for Garden and 10,760 sq. ft. of Playground) this is used by students at present for sports and some drone flying activities. Owing to the location of the premise amidst the urban area there is less scope for an additionally large space as compared to the population but **the efforts to maintain the existing space are commendable.**

4.1 Flora Audit

4.1.1 Flora analysis

As informed by the staff there are plants are cultivated in an area of 3,228 sq. ft. The landscape area has a variety of plantations as follows:

A) Trees

The trees constitute a **total of 3 varieties amounting to 29 numbers** in premise. The list of trees is as follows:

S. No.	Name	Planted by	Location	Nos.
A1	Ashoka	During Tree Plantation Event	Garden area	25

A2	Cycas	Planted During Event		2
A3	Champak			2

Table 3: List of Trees available in premise

B) Shrubs

The shrubs are among the highest contributors of all the varieties of plantations in premise and available in a **total of 2 varieties amounting to 120 numbers** in premise. The list of trees is as follows:

S. No.	Name	Planted by	Location	Nos.
C1	Rose	Planted by students	Garden Area	50
C2	Palm			70

Table 4: List of Shrubs available in premise

4.1.2 Green practices

We observed the following points during the Site investigation:

- The Nature Club Team (Nirmaly Sankalan) and Admin staffs have joined hands towards the upgrading of the premises from environmental view and have conducted Nature awareness program on World Environment Day 5 June 2021.
- There are total of only few Maintenance staff who manages the entire campus.
- There are no chemical fertilizers utilised in the premise.

4.1.3 Eco-friendly initiatives undertaken

The Institution has undertaken the following initiatives through **excellent efforts** towards save environment measures before pandemic. The Nature Club Team (Nirmaly Sankalan) holds the nature club and various activities like tree plantation, nature cleanliness, visits to nearby flora and fauna are carried out.

4.2 Noise Audit

4.2.1 Macro level

On a macro level there are settlements close to the site. The approach road too has balanced traffic. As the college is oriented amidst the residential areas including close by Market and shopping areas as well as Bus stand and railway station which are close by thus there is some amount of noise from the surrounding areas. **Overall the noise level is moderate as per our analysis on macro level.**

4.2.2 Micro level

The college has a minimal open space covered but it has hardscape paving which is not useful in keeping noise levels low. There is provision for staff parking which causes some noise. The college has generator but there is major sound problem caused due to the same. There are no particular equipments which cause any effect. **Overall the noise levels inside the premises are between moderate and low which is a good approach.**

4.3 Carbon Footprint Audit

4.3.1 Eco-friendly Commuting Practices

Based on data collection and discussion with staff the following points were noted:

- **Ease of commuting –** Owing to close proximity to public transport the access is very feasible and walk able.
- **Parent's commute -** There are 2 Parent-teacher meetings held in a year and the turn-out is around 60%
- **Vehicles details** – The provision provided by College includes parking for 30 Cycles, 40 Bikes, 15 Cars at present on an average there are about 5 to 10 visitors vehicles parked daily.
- **Commute details** – The students commute from Jalgaon city. The details of vehicles are summarised in tabular format below.

Total Number of vehicles used by stakeholders of College (per day) excluding parking provisions					
S. No.	**Vehicles**	**Nos.**	**Average distance travelled**	**Approximate quantity of fuel**	**Amount used per day**
1	Cycle	30	2 Km	Nil	Nil
2	Bike	40	4 Km	8 ltr	Rs. 800
3	Cars	15	4	8 ltr	Rs. 800
4	Bus	Nil	Nil	Nil	Nil
5	Common (public) transportation	100	4	Nil	Rs. 2000

Table 5: Vehicles usage by stakeholder of campus

4.3.2 Heat Island Reduction

The Institution has adopted the following practices which are yielding positive results in terms of Urban Heat Island Effect which refers to increase in temperature of the surrounding because of ineffective strategies.

Exposed roof areas – The terrace is flat roof some of the part is covered with solar panels.

Exposed non-roof hardscape areas - There is a pathway on all sides of the premises. These include some natural and potted plantations.

There are adequate measures adopted in the premises to reduce heat island effect of Building roofs.

4.3.3 No Outdoor Light Pollution

The college compound lights are not upward looking there not causing light pollution.

4.4 Health & Hygiene Audit

4.4.1 Smoke Exposure

As per the Site visit the following analysis has a positive impact on premises.

- The college has No Smoking on its compound wall as part of the awareness.
- Canteen uses Gas cylinders for cooking, there is no utilisation of fire wood. Thus there is no smoke from burning of fire wood and any health issues related to the same.
- The garbage in campus is not burnt and there is not air pollution because of it.
- The Institution is a tobacco and smoke free campus which helps in adapting to a Healthy Institution
- There is parking provision inside the campus there is slight issue of dust owing to the same but it is balanced with the thick vegetation in the premise.

4.4.2 Hygiene

- For overall hygiene of the students and staff there are facilities such as Washroom facility, hand wash, Napkin disposal facility, Waterless urinals, drinking water facility as Aquaguard.
- The hygiene of toilet areas is well maintained.

- **The entire campus is cleaned twice on a daily basis and given to Municipality, it is very appreciating that there are only few Maintenance staff who strive their best to take care of the entire premise in the most excellent way possible.**
- There are designated Hygiene specialist and Maintenance staff who keep a regular check about the operation and maintenance of the toilet areas and the equipments, lights and all facilities on each floor.
- Water management initiative with appropriate hygiene is undertaken. The areas of water tanks in site on ground floor are clean and no mosquito breeding spots are there.
- There are pest controls program practiced with appropriate sanitation facilities and Annual Maintenance Contract for pest control is done once a year by professional Pest control units
- The food premises and equipments are cleaned as per schedule with special care taken to avoid any water stagnation.
- The food waste and other refuse are removed periodically from food handling areas to avoid accumulation.
- There are appropriate storage areas which are well maintained.

4.5 Universal Campus

As per World Report on Disability, 2011 there are 180 million approx. Persons with Disabilities that makes it 15% of total population of India.

There are Handrails along staircase and Universal toilet as part of universal campus initiatives. The design of the premises is appropriate for access with passages. The doubly loaded corridors are safe from fire safety as there are staircases and fire extinguishers provided. **There is a provision of ramp, universal toilet in premise.**

4.6 Survey Results

An online survey was conducted to analyse the student and staff views about the premise, following are some of the reviews.

4.6.1 Participation

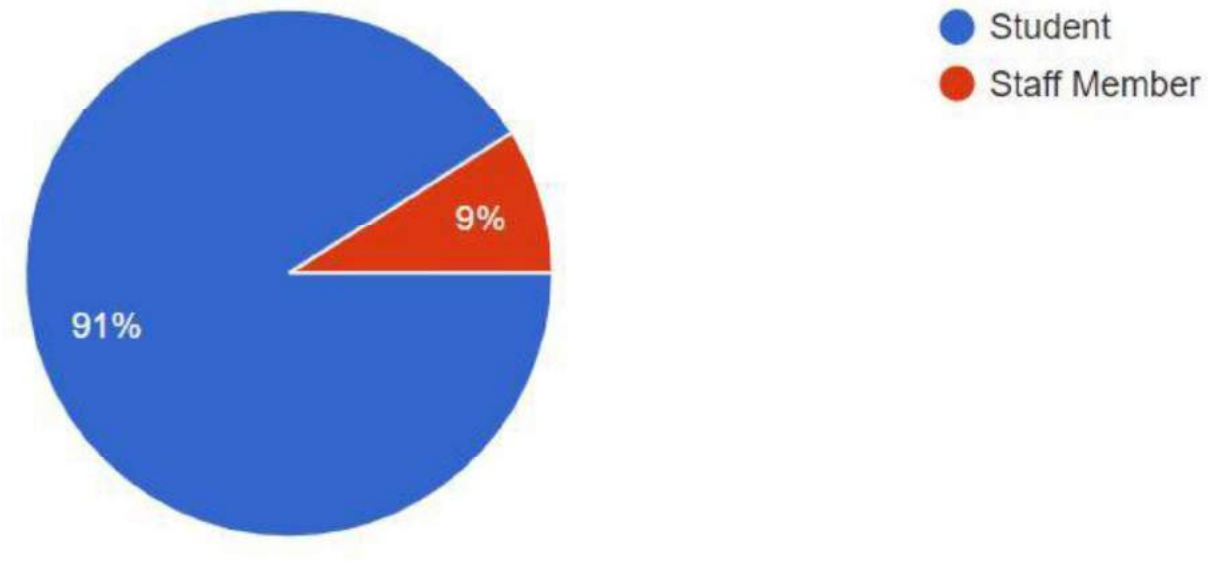


Figure 4: Participation analysis in the survey

A total of **212 responses** were received out of which 91% were students.

4.6.2 Rate the Green awareness practices in College

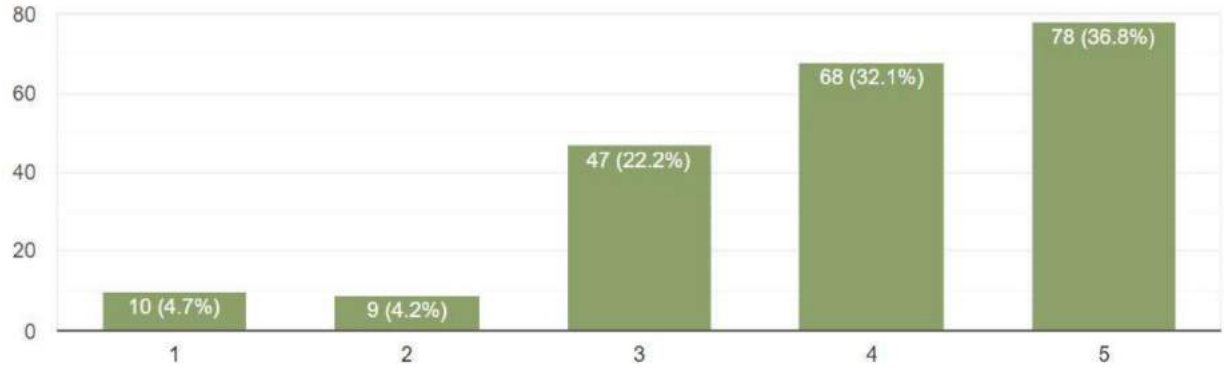


Figure 5: Green awareness practices in College

The students, staff **(almost 78%)** of responses found the practices to be excellent.

4.6.3 Does your College conduct environment awareness programs/ webinars/ plantations/ cleanliness or similar programs?

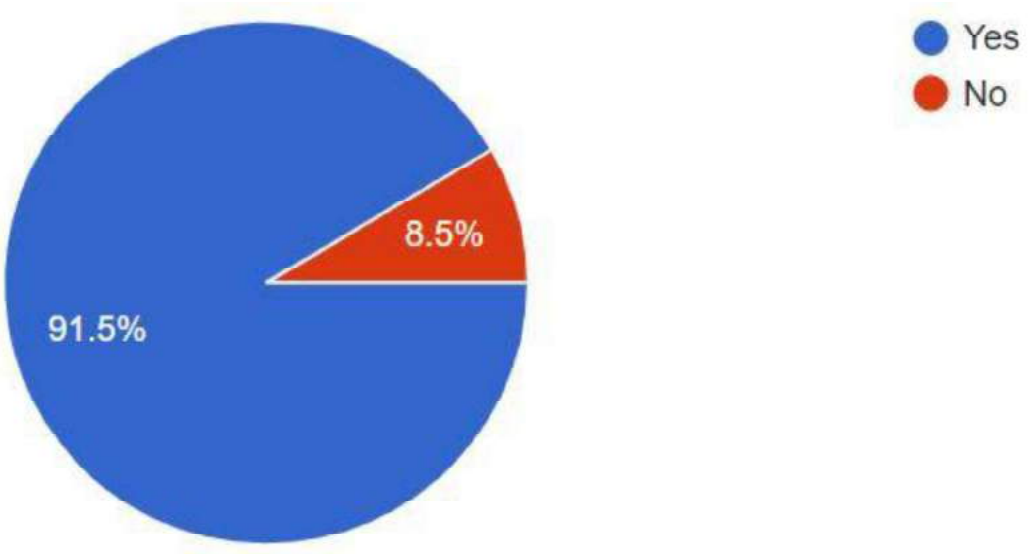


Figure 6: Green awareness practices in College

The students, staff **(almost 92%)** of responses confirmed activities are conducted which is very excellent.

4.6.4 Do you participate is such events?

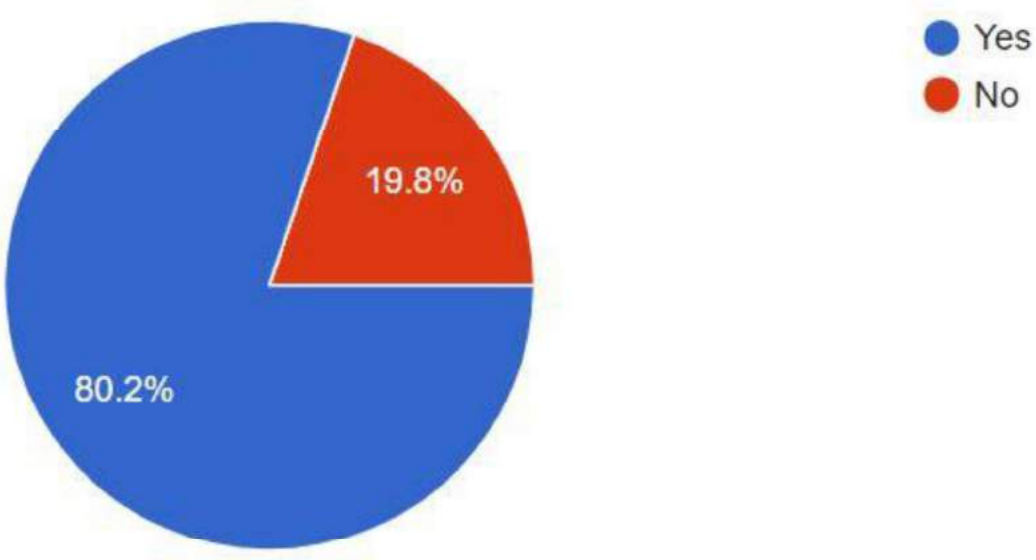


Figure 7: Green awareness practices in College

The students, staff **(almost 80%)** of the responses confirmed their participation.

4.6.5 If yes, what has been your experience about the program?

We have listed some of the key responses below.

- Satisfied
- Good Organized
- Very nicely organized programs and create awareness
- Very Good
- Great learning
- It is very important for human life and the experience was nice.
- They plant trees on the environment day and also provide sapling as a gift on birthday to faculty
- It was good experience
- Very informative.
- I feel that it is very important to look at our environment, not me but everyone and i am blessed that i am studying in IMR college which are conducting suc a program
- The program has given a lot of information about Environment and how we can protect this environment
- Nice, these programs create awareness among students and teachers.
- Great
- All over nice
- That was very nice and we experience something new like other people are getting awareness about how to recycle reuse and renew as renewable source. All thanks to our ma'am for conducting this program...
- Nice environment program and i also like to the green plantation.
- We got lots of experience from different personalities and their ideas about concern topic
- All the program held in our college are about how we save our environment with working on issues like water pollution, air pollution and also like tree plantation. It take us one step closer to environment.
- The best events in college
- It's to good that our collage is providing this type of awareness of environment
- It was great to be a part of such a wonderful experience
- The program helps to spread awareness about environment and vital information about environment
- Nice
- Tree plantation program
- Good
- It is mandatory for all to attend, because we all should come together and safe Mother Nature.
- It is very good work to save the environment and planting the tree surrounding areas
- Planting trees and taking care of them.
- Great experience
- Very good
- Great experience when I Attended this type of program, events , Seminars and other all things.
- Many ideas about environment awareness
- About Plantation of trees to reduce Global warming and to save water

- Is good and it's give a many more option.
- It's really such beautiful program
- It is very nice for the environment
- It was good and cheerful.
- Nice
- Need to learn about new things in webinar on different topics and tree plantation or cleanliness is our necessary to keep our environment clean and more green. Good experience.
- Nice, institute has already taken all the necessary activities in the programs or webinar about environment awareness.
- That experience very good and helpful for future
- To learn n make other to understand also so it helpful for them to
- Environmental Awareness
- I feel that our institute is very good about the social activities
- Very nicely the explain about the importance of this program and it's help us in our environmental subject or in daily life .
- Excellent
- Fantastic
- The program was so useful for environment
- Its very eco friendly, supportive toward society and encourage the people to adapt new eco friendly ways and vision...
- The program was good . Awareness should spread in youth and college conducting it regularly.
- To grow more and more plants
- The program are excellent and inspiring
- Awareness about nature
- We learn Many Things and get Good Knowledge
- Really very good
- My Experience for environment awareness program conducted in our college is wonderful. Now I'm good human being for the environment..
- Nice experience, spending awareness in students against cleanliness.
- Get to know the responsibility of us to clean and green our environment
- Its very good thing N well organised
- Very good
- High knowledge
- Superb
- It good and energetic experience.
- This kind of programmes helped me a lot
- That was good, I get to know more about our nature and ways to save it.
- It's Fabulous & I really enjoyed all events...
- Students are involved and participate enthusiastically
- It was great, I learnt few things about that... Overall it was a great experience

4.6.6 What according to you are the positive steps taken by the Institute towards Green Building/ Good maintenance?

We have listed some of the key responses below.

- **Giving plants to visitors as memento and also giving plants to faculty members on birthdays**
- Green Building
- Solar energy, rain water harvesting
- Good indoor environmental air quality
- Yes positive steps taken by the institutes towards green building good maintenance.
- Cleanliness and plants in campus.
- Plantation of tree
- They had created a seminar which provides a lot of information to people about Environment
- Use of LED lights in campus
- we experience something new like other people are getting awareness about how to recycle reuse and renew as renewable source. All thanks to our ma'am for conducting this program...
- No need to give advice bcz already they do everything ...
- Good staff
- Proper staff maintenance
- Institute have trees around the college area as well as inside College they planted little flower plants and environment educational posters, image as well as knowledgeable factors about environment are provided by professors and institute
- Firstly, in our institution there are plenty of plants and greenery everywhere. **Secondly, institution have provided Gardner to take care of plants and trees in Garden.**
- Various programmes on Tree plantation and awareness programme.
- Taking an intelligent approach to energy
- Institute has taken the following steps 1.Environmental preservation in the curriculum
- 2.Cleanliness or Swach Bharat Abhiyan as it is important to maintain a clean environment. 3.Environment preservation posters created digitally. 4. Adopted a Plant a tree program.
- **Safeguarding water resources**
- Plantation of trees in there backside ground or area or in parking side which give highly shadow to our vehicle
- It's nice to look around and find greenery around its feel present and clam
- The positive steps taken are; They conduct programs for increase in green colour not only in premises but in society also. They take good care of plants inside the premises making students aware of how its done.
- According to me, the positive steps taken by the institute towards green building or good maintenance the green buildings preserve precious natural resources and improve our quality of life and reduce or eliminate negative impact and can create positive impact.
- Nice a full greenery in campus and infrastructure is good
- **Adopting paper less work by implementing ERP system**
- Plant trees Conserve water No to single use plastics

4.7 Recommendations for a Sustainable Habitat by Greenvio Solutions

a) Seating areas

There can be provision outdoor seating areas.

b) Promote the use of Eco-friendly vehicles

There can be provision for cycle and battery operated vehicles/ low emission vehicles such as electrically driven vehicles parking in open space along with battery charge points, this would inspire students to change mode of transportation and adopt sustainable practices.

c) Low VOC Paints and Adhesives

Whenever the College undergoes repairs or renovations there should be use of materials with low emissions so as to reduce the adverse health impacts on workmen and the students occupying the space thereafter.

d) Cool rooftops

It is suggested that the College gets the Terrace roofs painted with Cooltop as it will help reduce the temperature of the spaces.

e) Environmental awareness

There can be various artworks on compound wall giving message of saving environment through the joint efforts of the students and staff thereby making the student socially and environmentally responsible citizen.

f) Fire extinguishers

There should be at least 1 fire extinguisher in each space where there is an air-conditioner and increased numbers on each floors.

g) Tree adoption scheme

The college can adopt One Faculty – One tree adoption scheme which is one of its kind practice, this can be very beneficial especially during the summer season.

Tree Plantation programme by College


Provision of Ramp, staircase with appropriate accessibility

Sanitary vending and disposal machine is made available in premise including water facility


Open spaces and natural and planted vegetation in the premise

Waste Audit

Background reference image Polina Tankilevitch on pexels

5. Waste Audit

Waste is an inevitable part of our lives. Over the years as the awareness about waste management techniques has given a rise to rethink how the waste can be avoided form being sent to the landfills. The audit provides an approximation of the types of waste generated, location of waste collections, disposal techniques used, waste segregation methodologies adopted, waste management strategies that are and implemented in addition to the newer ways the can be adopted aiming to make the premise clean and sustainable. Here sustainable refers to a broader aspect to analyse whether the current techniques are having positive or negative effect on the stakeholders of the premises.

5.1 Waste produced

5.1.1 Types and disposal of waste in Premise

The types of waste collected in the campus are as follows, these are separated before processing and the local Corporation helps to collect the waste and then taken away.

S. No.	Type of waste	Bio-degradable	Point of disposal
1	Solid	5 Kg	Municipal Corporation
2	Liquid	50 Litres	Drainage Line
3	Dry leaves	1 Kg	Municipal Corporation

Table 6: Summary of the types of waste produced in the premises

5.1.2 Bins summary

There are 51 Dustbins (provided with dry and wet waste segregation) in the premise. Out of these 50 are present inside the Institution with 10 dustbins per floor. The entire premise collects 2 kg of waste per week. The dustbin in the outdoor is a large dustbin with a capacity of 20 kg. All dustbins in the premise are provided with dry ad wet segregation. The indoor –outdoor analysis of dustbins is presented below.

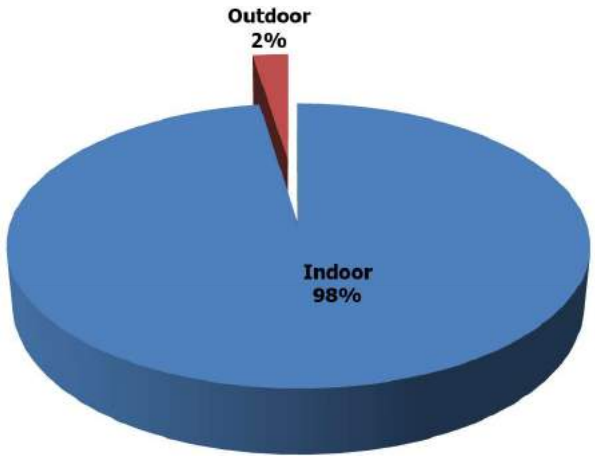


Figure 8: Analysis of dustbins in the premise

The above analysis shows the among the dustbins **98% are in the Indoor spaces** (On all floors, classrooms) and **2% in the outdoor spaces**.

5.2 Waste handling

Quantification wise as per Interview and survey it was found that the Solid, Dry leaves collected is approximately 6 kg per week. The liquid waste (connected to the drainage line) is approximately 50 litres per week. The waste produced on campus is segregated. It is collected on a daily basis as it is cleaned twice a day and handed over to the local municipality van.

5.3 Waste management

Ample measures are taken to maintain hygiene. No smell problem or health related issues due to the waste are there. There are adequate numbers of bins present in all parts of building. The waste does not pollute the ground or surface water. There is no problem of air pollution from waste as informed. The wastes from toilets are discharged to main drains through underground covered channels (Safety Tanks) thus avoiding any incident. There is provision for Sanitary Napkin Vending and Disposal Machine in the premise as one Incineration Unit in Ladies Wash Room for proper & hygienic disposal of sanitary napkins. There are signages in College mentioning awareness about cleanliness.

5.4 Survey Results

An online survey was conducted to analyse the student and staff views about the Waste management practices adopted in College, following is the result received.

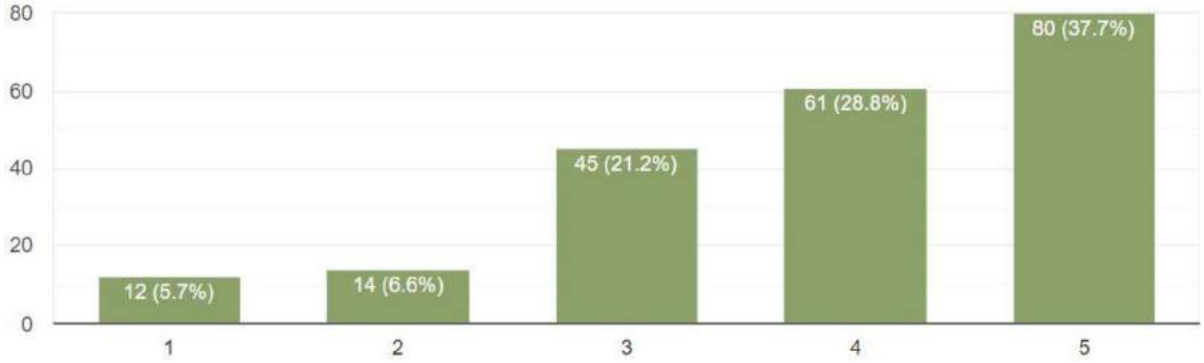


Figure 9: Waste management practices in College

The students, staff **(almost 80%)** of responses found the practices to be excellent.

5.5 Recommendations for a Sustainable Habitat

The following practice can be adopted for further up gradation.

a) Zero Waste

The college can undertake a zero organic waste protocol. The following practices can be adopted as part of the same.

- The food waste generated by the students and staffs are taken by them to their own home, so that, minimum waste is generated inside the premises.
- The organic waste generated in the canteen is used as feed for a biogas plant and the biogas is used as fuel in college canteen.
- Vegetable waste and other leaf litters can be used to fed in the vermi-compost pit and the resulting vermin-cast is used as manure in the garden.
- The chemicals from the laboratories be disposed in a sealed tank along with water, so that the chemicals undergo neutralization with the water.

As part of the above there will be a requirement for a Biogas plant, vermin-compost pit, awareness signages, sealed tank for waste water from chemical laboratory.

b) Organic Compost

As we have suggested in the Ecological Audit the provision for sustainable practices such as Kitchen garden and Terrace Garden there can be an organic compost pit in the open space in premises.

c) Incinerators

The Incinerators should be installed in Girls toilets for disposal of sanitary napkins

d) Increased dustbins

There should be ore number of dustbins in outdoor areas.

Dustbins

Signages

Water Audit

Background reference image Vlad Chetan on pexels

6. Water Audit

Water is one of the basic needs. Pure drinking water is a resource which needs to be preserved efficiently. Water audit helps to identify the sources of water consumption, the water requirement by the campus met by these sources. The points and effective usage of without any wastage. Understanding the techniques which are best suited to the site to increase water conservation in terms of awareness and practice.

6.1 Water availability and consumption

6.1.1 Sources of Primary water supply

The main source of water is through Municipal Corporation water connection. The total water consumption through the tanks on site is as follows:

S. No.	Type of tank	Nos.	Location	Capacity in litres
1	Overhead tank	1	Terrace	10,000
Total				**10,000**

Table 7: Tanks in the premise

6.1.2 Sources of Secondary water supply

a) Total 1 Bore well is available on the site as underground water facility with daily water being pumped for using submersible pump of 2 HP and 1HP pump each for 2 hours a day. The actual depth of the well near the playground is 30m and present depth is 20m. On a daily basis nearly 3,000 to 6,000 litres of water is pumped for usage depending on the need. The Rain water harvesting is done through the roof water being used for bore well recharging.

b) Rainwater harvesting details – The rainwater collected on terraces, roofs, balconies, and on grounds is smartly directed to the garden area and underground storage area. Also, rainwater is harvested by using simple techniques like using jars and pots. Through pipes, water is accumulated and restores in underground deep pits and tanks.

6.1.3 Water consumption through Aquaguard

There is provision for 2 Aquaguards which consume 20W for approximately 5 hours and is used only in the months of April and May. It is present on the Ground floor in

Admin Department. Its capacity is 40 litres but the premise utilises 20 litres on daily basis. There is no water scarcity during summer season and the water management, sanitation and supply scheme is well maintained.

6.2 Water requirement

The main areas of water requirement and type of usage is as follows

- **Drinking water –** General water required for drinking purpose using around 150 litres of water through Aquaguard available in the premise.
- **Toilet blocks**– General usage by occupants in toilets, urinals, bathrooms, wash basins using approx. 250 litres of water daily and
- **Cleaning of the premises –** The entire Institution is very well maintained with respect to hygiene and cleaning is one of the major uses of water requirement. **The toilet areas are cleaned thrice a day.**
- **Garden and surrounding open space** – Cleaning, watering the plants requires approximately more than 100 litres of water on alternate days in winter season and about 2-3 times a day in summer season on a regular climate day it is watered 3 days a week and in rainy season it is dependent on the monsoon showers. Automatic sprinkler system is used for irrigation purpose.

6.3 Areas of water usage

The following is a summary of the general water usage spaces - toilets, urinals, shower, flush tanks and wash basins/ taps in the premises.

S. No.	Floor	Lavatories			Taps		
		Girls	Boys	Staff	Girls	Boys	Staff
1	Ground	2	6	2	4	10	5

Table 8: Summary of the water consumption in the premises

Based on the inventory done and data shared by the staff it was found that the premise has a total of 10 lavatories (including urinals), 19 taps in toilets.

As per the data shared by the College, it was noted that there is wastage of water to a certain extent in the form of Cleanliness of toilets.

6.4 Site investigation about water management.

- There was no water leakage in the entire premise, the pipes well maintained with adequate hygiene.
- **The premise has an efficient water management in terms of operations and maintenance.**
- The toilets are kept very tidy and are cleaned appropriately.
- **The waste water is reused for Gardening.**
- The drip irrigation and sprinkler system are used in the Gardens.
- The college has **rainwater harvesting system in the form of a soak pit** which is very useful.
- There is sufficient number of taps in the premise.
- **Signages are included with information about avoiding water wastage near taps and wash basins.**

6.5 Survey Results

An online survey was conducted to analyse the student and staff views about the Water management practices adopted in College, following is the result received.

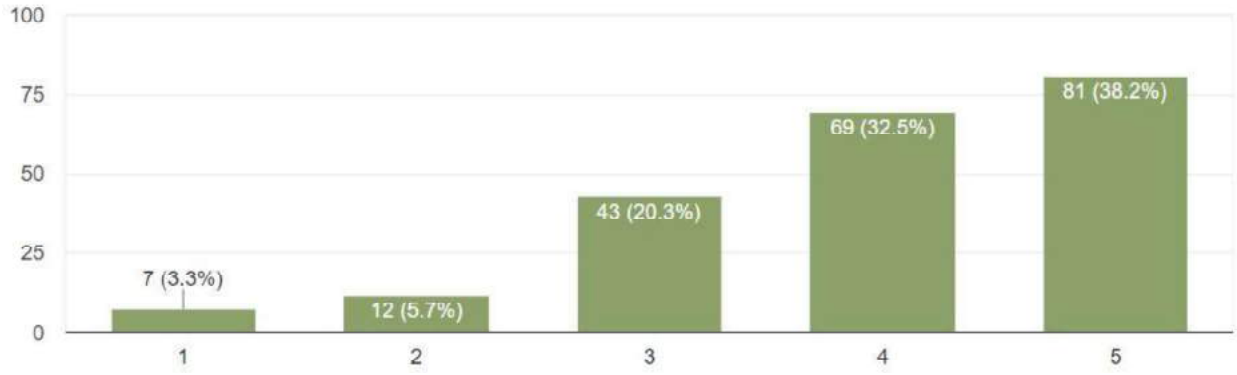


Figure 10: Water management practices in College

The students, staff **(almost 81%)** of the responses found the practices to be excellent.

6.6 Recommendations for a Sustainable Habitat

Below mentioned are few suggestions for better water management practices in the premise.

a) Universal Toilet

At least 1 toilet should be made for specially abled as per universal design norms.

b) Waste water from toilets

This should be collected and a waste water treatment plant can be installed in the open space wherein this water can be treated and reused for gardening and toilet flushing.

Water cooler

Water sigage

Water cooler

Water pump

सरदार वल्लभभाई पटेल टॉवर, प्रशासकीय इमारत महात्मा गांधी रोड, जळगांव-४२५००१
फोन : २२२२२६१ ते ६५ email : jcmcjalgaon@gmail.com

म.न.पा.ले.सं. १९७१ नमुना क्र. ४९

मालमत्ता कर संकलन विभाग

वसुलीची पावती

पावती क्र. 4296

संदर्भ देयक क्रमांक	[illegible]
मागणी नोंद वही क्रमांक :	[illegible]

प्रभाग समिती क्र./ युनिट क्र. ०१०६
प्लॉट क्र./ घर क्र.

मिळकत धारकाचे नांव : [illegible]

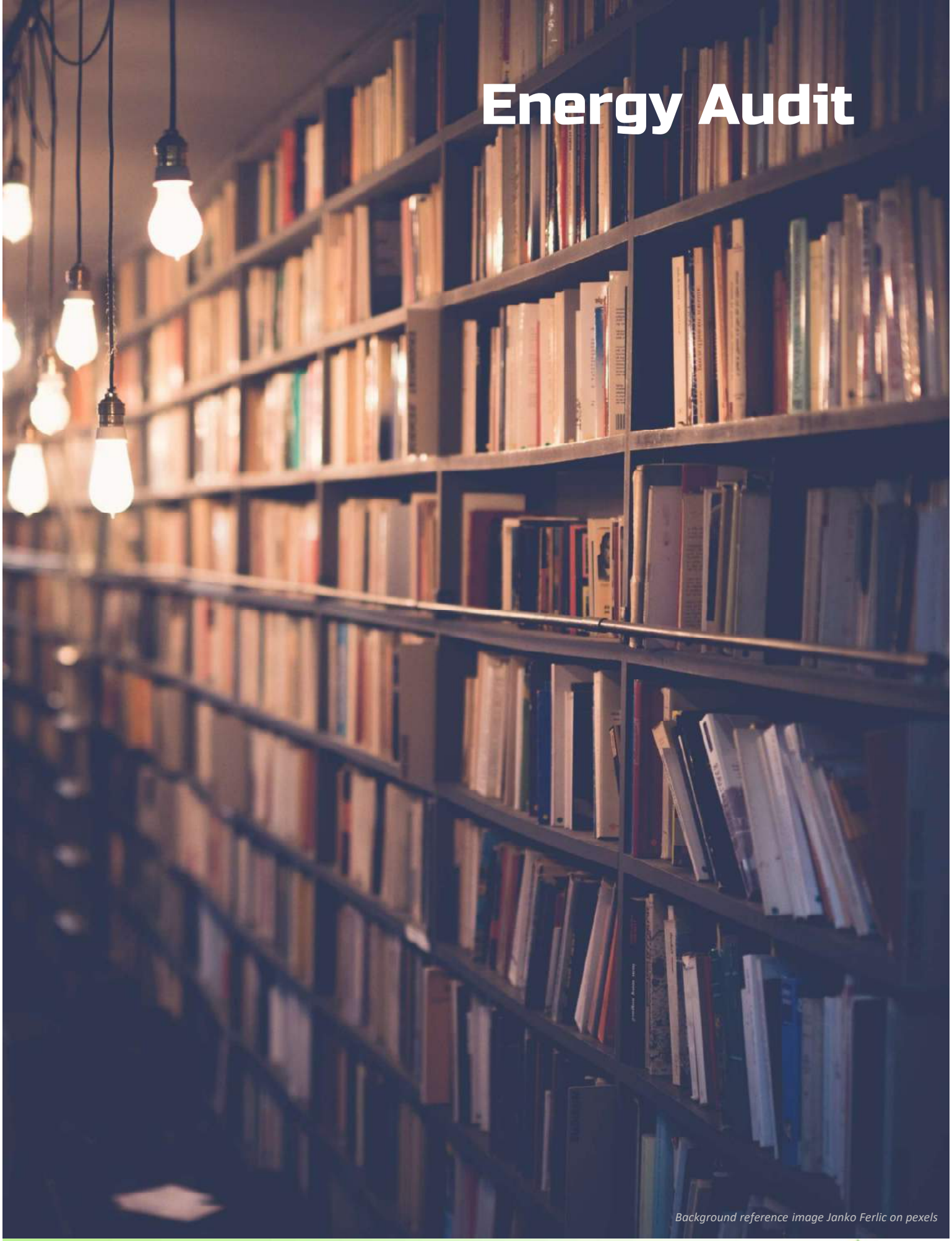
करांचे नाव	मागील रक्कम रुपये	२०१९ - २०१० ची रक्कम	एकूण रक्कम रुपये
१ सामान्य कर		२०४४६	
२ पाणी पुरवठा लाभकर		३०७६	
३ साफसफाई कर		[illegible]	
४ मलप्रवाह सुविधा लाभकर		३०७६	
५ अग्निशमन कर		३०७६	
६ म.न.पा.शिक्षण उपकर		[illegible]	
७ रस्ताकर		[illegible]	
८ घन कचरा व्यवस्था रहिवास सेवा शुल्क			
९ घन कचरा व्यवस्था अरहिवास सेवा शुल्क		[illegible]	
एकूण (अ.नं.१ ते ९)		[illegible]	
सुट रक्कम		[illegible]	
सुट वजा जाता एकुण रक्कम		[illegible]	
१० विशेष पाणी पट्टी			
११ विशेष साफसफाई कर			
१२ वृक्षकर		[illegible]	
१३ महाराष्ट्र शिक्षण कर		[illegible]	
१४ रोजगार हमी उपकर		[illegible]	
१५ संडास पट्टी/प्रोजेक्शन फी			
१६ नोटीस फी			
१७ वॉरंट फी			
१८ शास्ती			
एकूण (अ.नं. १० ते १८)		[illegible]	
अ. एकूण (अ.नं.१ ते १८)			
पाणीपट्टी			
१. पाणीपट्टी रक्कम		[illegible]	
२. सुट रक्कम रु.		[illegible]	
३. सुट वजा जाता रक्कम		[illegible]	
४. नोटीस फी			
५. वॉरंट फी			
६. शास्ती			
क. एकूण (अ.क्र. ३ ते ६)			
एकूण (अ + क)		[illegible]	[illegible]

एकूण अक्षरी रक्कम रुपये [illegible] प्राप्त झाले.

दिनांक [illegible]/२०१९

(

Energy Audit



Background reference image Janko Ferlic on pexels

7. Energy Audit

7.1 Sources of Energy consumption

The premise uses following sources of energy consumption.

7.1.1 Primary sources

1. **Electrical (Metered)** – Light, Fans, AC, Equipments, Pumps consume approximately 10,147 units from one Meter 1 and Rs. 1,13,202/- per month (average) in last year.
2. **Solar** – There is provision of solar panels

7.1.2 Secondary sources

1. **Generator** – There is one Diesel Generator of 125 kVa used for two hours and on an average Rs. 11,000/- is spent per month for the fuel.
2. **UPS** – There is provision of 3 UPS in the premise.

7.2 Site investigation analysis

The Site investigation observations and interviews with the Maintenance staff, Electrical department in charge are summarised below:

- The **switch-off drills are practised at present,** the inbuilt power saving mode in every Computer and main switch is functioning.
- There are **40 display boards encouraging staff and students to save energy are put up in the classrooms and laboratories**.
- There are **no Ultra-violet lights and any other harmful lights used** in the premise.
- Entire premise has **LED Lights.**
- All class rooms and office is **ventilated using natural light.**
- **Smart monitors to save power.**

7.3 Actual Electrical Consumption as per Bills

The admin department had shared the bills for Meter and it is the main source of energy supply. The supplier is Maharashtra State Electricity Distribution Limited. The type of supply is **LT – Low Tension (073/LT VII (B I) Public Service Other).** The details of unit consumption meter wise are as follows:

Month	Units in kW		Month	Units in kW
Jun-20	29,389		Jun-18	18,883
Jul-20	6,293		Jul-18	17,919
Aug-20	8,413		Aug-18	17,274
Sep-20	9,797		Sep-18	18,621
Oct-20	10,026		Oct-18	20,207
Nov-20	7,583		Nov-18	10,134
Dec-20	7,774		Dec-18	8,657
Jan-21	9,281		Jan-19	8,885
Feb-21	7,516		Feb-19	10,191
Mar-21	9,572		Mar-19	15,425
Apr-21	8,348		Apr-19	16,977
May-21	7,774		May-19	19,041
Total	**1,21,766**		**Total**	**1,82,214**

Table 9: Study of the electricity consumption of the meters in premise

The summary of the above study shows the monthly consumption varies.

7.4 Calculated Electrical Consumption as per inventory

The electricity bills provide actual consumption data. The following is the calculated consumption. It is done to understand the percentage of energy usage in the premises by various applications. It is based on the inventory collected and interviews with the staff. The additional data such as wattage is taken from market research. In terms of electrical consumption, the main sources are lights, fans, ac, equipment. In this the key energy is consumed by Motors used for AC which are considered in equipment analysis. The inventory and data collection for sources of energy consumed in the premise in summarised in the following sections.

Note: The following analysis is combined for entire premise taking into considerations the duration before pandemic to understand the consumption pattern as post pandemic the premise is used only for a few hours.

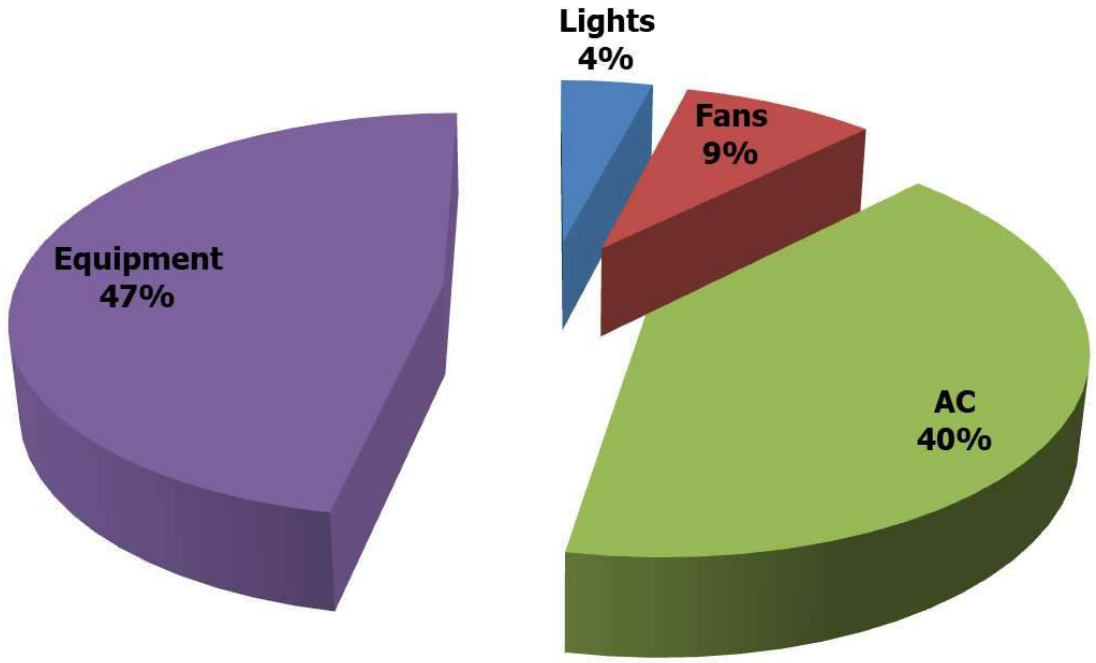


Figure 11: Summary of the Calculated Electrical Consumption as per inventory

The above graph shows that Equipment consumes 47% followed by AC at 40% while Fans consumes 9% and Lights consume 4% of the total calculated electrical energy.

7.5 Lights

7.5.1 Types of lights

There are a total of **387 LED lights in the premise.**

7.5.2 Floor-wise consumption analysis

The energy consumption of Lights is **9,400 kWh** of energy; the following graph shows the floor wise consumption. This section analysis constitutes all buildings as a single entity.

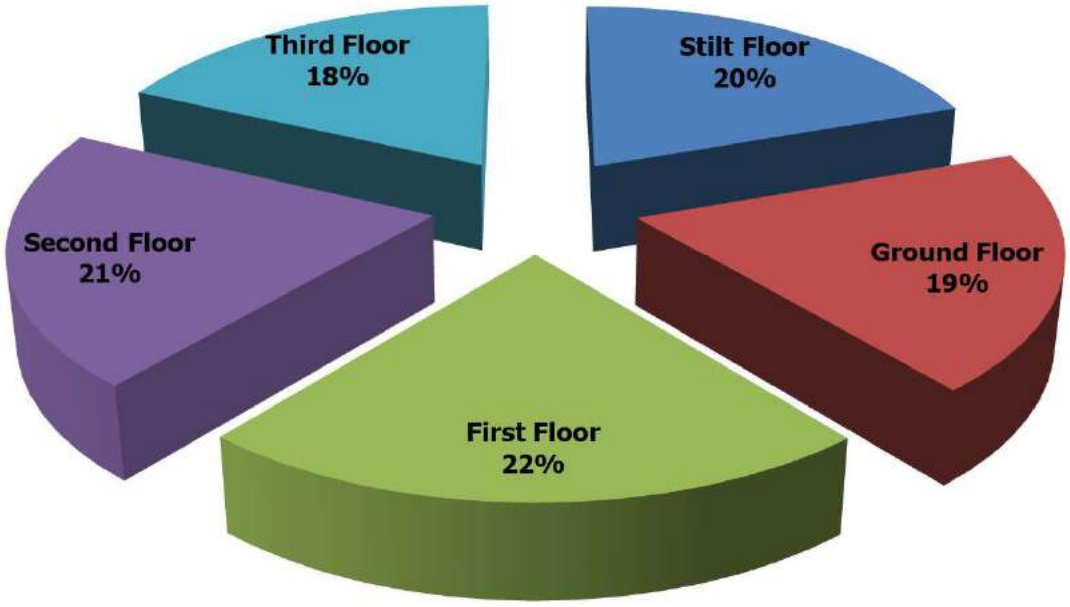


Figure 12: Energy consumed by Lights floor wise

The above analysis shows the lights in the **First floor consumes highest amount of energy of 2,074 kWh at 22%** the **Second floor consumes 1,958 kWh at 21%** the **Stilt consumes 1,843 kWh at 20%** the **Ground floor consumes 1,826 kWh at 19%** and **Third floor consumes 1,699 kWh at 18%**

7.5.5 Requirement of NAAC

7.5.5.1 Alternative Energy Initiative

Percentage of power requirement met by renewable energy sources – There are solar panels available in premise at present.

7.5.5.2 Percentage of lighting power requirement met through LED bulbs

The premise has LED lights in form of Tubelights, floor lights and 100% of the lighting requirement is met through LED.

7.5.6 Site investigation observations

Some of the points noticed are as follows:

1. All of the lights are led
2. All lights are in working conditions
3. Daily monitoring and check is done by the maintenance staff.
4. There was no fuse defect observed.

7.6 Survey Results

An online survey was conducted to analyse the student and staff views about the Energy management practices adopted in College, following is the result received.

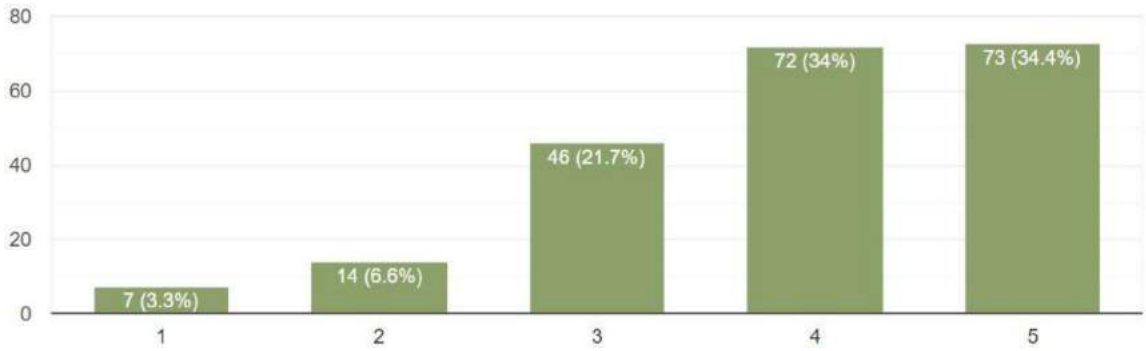


Figure 13: Energy Management practices in College

The students, staff **(almost 73%)** of the responses found the practices to be excellent.

7.7 Fans

7.7.1 Types of fans

There are a total of **275 fans** in the premise. The following table shows the various types of fans in the premises.

S. No.	Type	Nos.
1	Ceiling Fan	265
2	Wall Mounted	2
3	Exhaust	8
Total		**275**

Table 10: Summary of the types of fans in premise

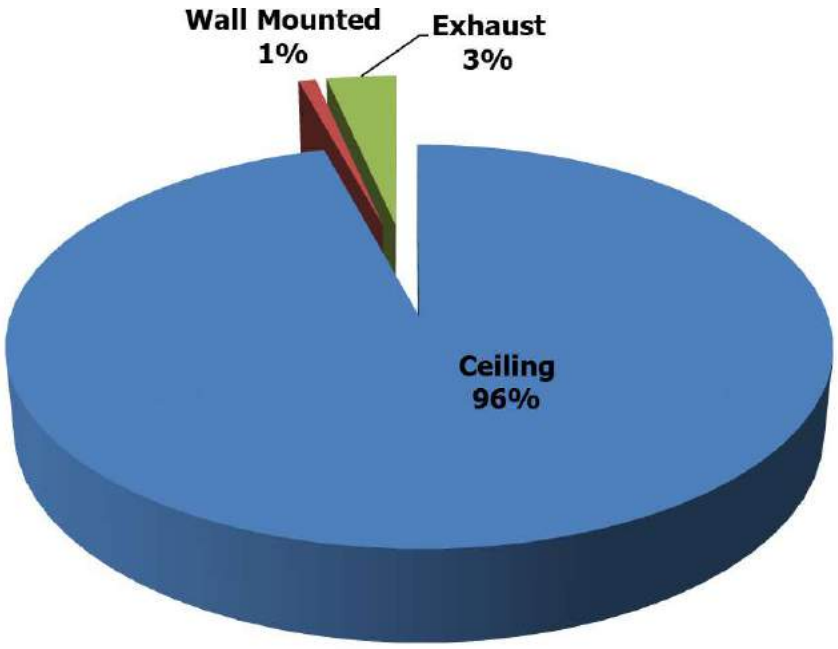


Figure 14: Types of Fans in the premise

The analysis of the types of fans in premises shows **Ceiling fans consume 18,921 kWh at 96%** while the **Exhaust fans consume 666 kWh at 3%** and **Wall Mounted fans consume 167 kWh at 1%**

7.7.2 Floor-wise consumption analysis

The energy consumption of Fans is **19,754 kWh** of energy; the following graph shows the floor wise consumption. This section analysis constitutes all buildings as a single entity.

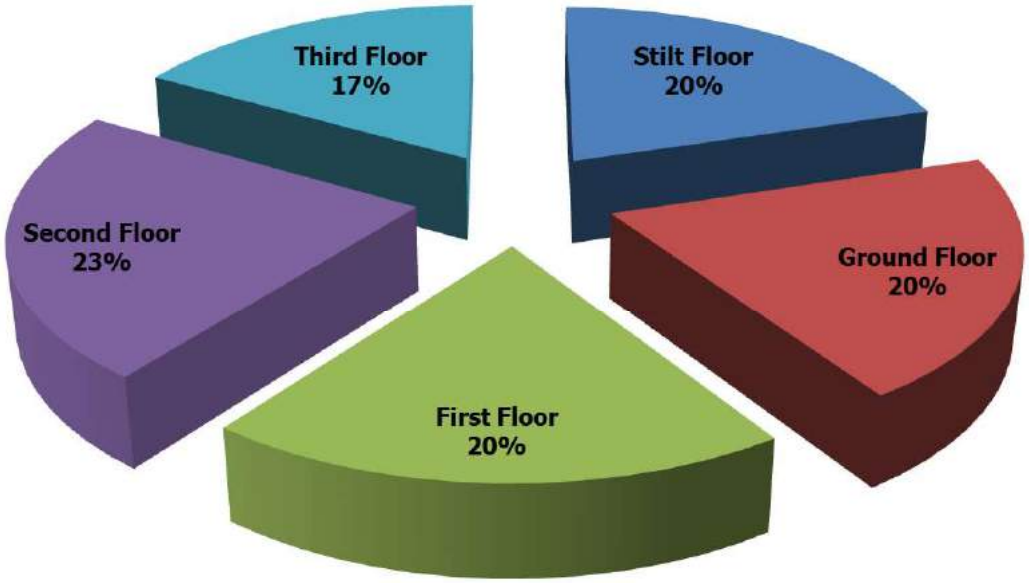


Figure 15: Energy consumed by Fans floor wise

The above analysis shows the Fans in the **Second floor consume the highest amount of energy of 4,522 kWh at 23%** followed by **the Ground floor (4,046 kWh), Stilt floor (3,998 kWh) and First floor (3,879 kWh) with a marginal difference consumes 20%** whereas the **Third floor consumes 3,308 kWh at 17%**

7.7.4 Site investigation observations

Some of the points noticed are as follows:

1. All fans are in working conditions
2. Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.

7.8 AC

7.8.1 Types of AC

There are **45 Air conditioners at multiple locations** in the indoors of the premise. Below mentioned is a summary of the AC in the premise.

S. No.	Room Name	Floor	Nos.		Tonnage	Make
1	Placement	Stilt Floor	1	1.5 Ton	1 Star	Lloyd
2	Lab I	Stilt Floor	3	1.5 Ton	1 Star	Lloyd
3	Lab II	Stilt Floor	4	1.5 Ton	2 Star	Lloyd
4	Lab III	Stilt Floor	3	1.5 Ton	3 Star	Lloyd
5	Lab IV	Stilt Floor	2	1.5 Ton	4 Star	Lloyd
6	Lab VII	Stilt Floor	3	1.5 Ton	4 Star	Lloyd
7	Lab VI	Stilt Floor	4	1.5 Ton	3 Star	Lloyd
8	Lab V	Stilt Floor	3	1.5 Ton	4 Star	Lloyd
9	HOD Cabin	Stilt Floor	1	1.5 Ton	5 Star	Lloyd
10	Director Office	Ground Floor	2	1.5 Ton	4 Star	Lloyd
11	Admin Office	Ground Floor	2	1.5 Ton	4 Star	Lloyd
12	HOD Cabin	Ground Floor	2	1.5 Ton	4 Star	Lloyd
13	Conference	Ground Floor	3	1.5 Ton	4 Star	Lloyd
14	Boys Common Room	Ground Floor	2	1.5 Ton	4 Star	Lloyd
15	First Aid Seekroom	Ground Floor	1	1.5 Ton	4 Star	Lloyd
16	Store Maintenance, House Keeping	Ground Floor	1	1.5 Ton	4 Star	Lloyd
17	Girls Common Room	Ground Floor	2	1.5 Ton	4 Star	Lloyd
18	Auditorium Hall	Ground Floor	4	1.5 Ton	3 Star	Lloyd
19	Faculty Room MCA	First Floor	2	1.5 Ton	4 Star	Lloyd
Total			**45**			

Table 11: Details of the air-conditioners in premise

7.8.2 Floor-wise consumption analysis

The energy consumption of AC is **93,177 kWh** of energy; the following graph shows the floor wise consumption.

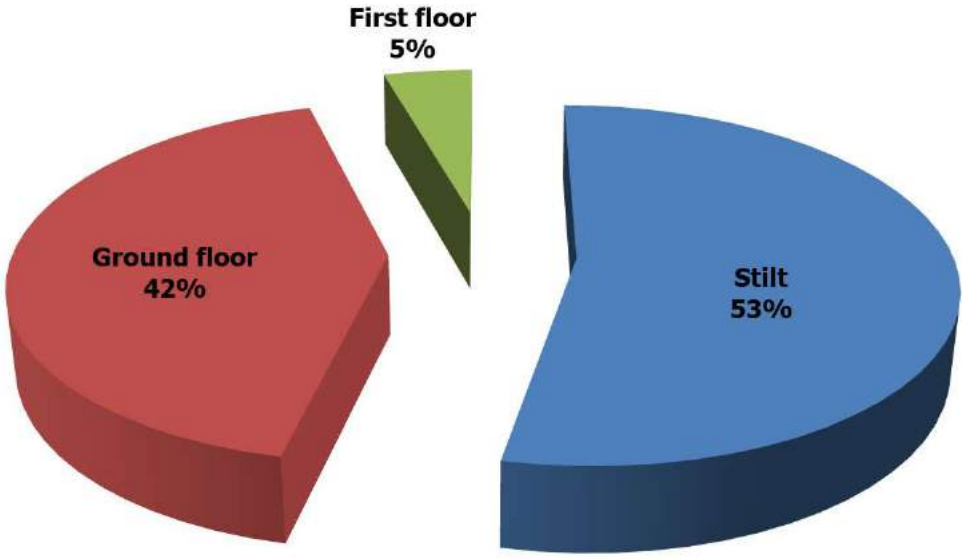


Figure 16: Energy consumed by AC floor wise

The above analysis shows the AC in the **Stilt consumes the highest amount of energy of 49,694 kWh at 53%** whereas the **Ground floor consumes 39,341 kWh at 42%** and **First floor consumes 4,141 kWh at 5%**

7.8.3 Site investigation observations

Some of the points noticed are as follows:

1. The AC are old and should be replaced.
2. Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.
3. The Outdoor Units are properly cleaned and maintained well.
4. The Outdoor Units do not have any dust collection problem.

7.9 Equipment

7.9.1 Types of Equipment

There are a total of **3 types of equipment totalling to 384 in number** in the premise. The various types are mentioned in the table below.

S. No.	Name	Nos.
S. No.	Name of the Equipment	Nos.
1	Pump	1
2	Computer	352
3	Projector	31
4	Water cooler	2
Total		**386**

Table 12: Types of equipment in the premise

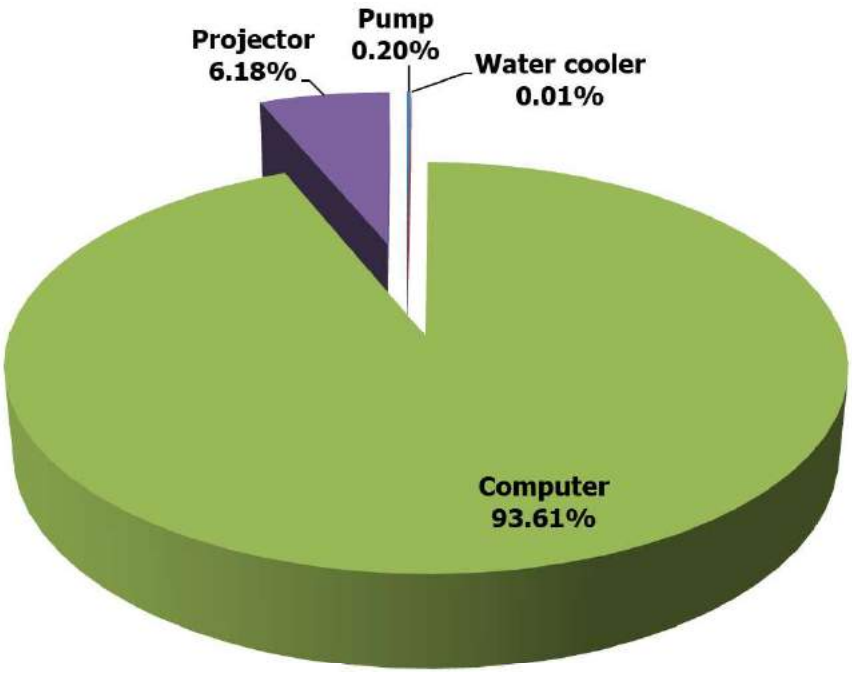


Figure 17: Summary of Energy consumed by Equipment

The above summary shows that **Computer consumes more energy at 93.62%** while **Projector at 6.18%** and the **Pump consumes 0.20%**

UPS (when used for electrical consumption else it is a battery backup and does not require electricity as an equipment) is also one of the equipment but is excluded in this calculation.

7.9.2 Floor-wise consumption analysis

The energy consumption of Equipment is **1,08,293 kWh** of energy; the following graph shows the floor wise consumption. This section analysis constitutes all buildings as a single entity.

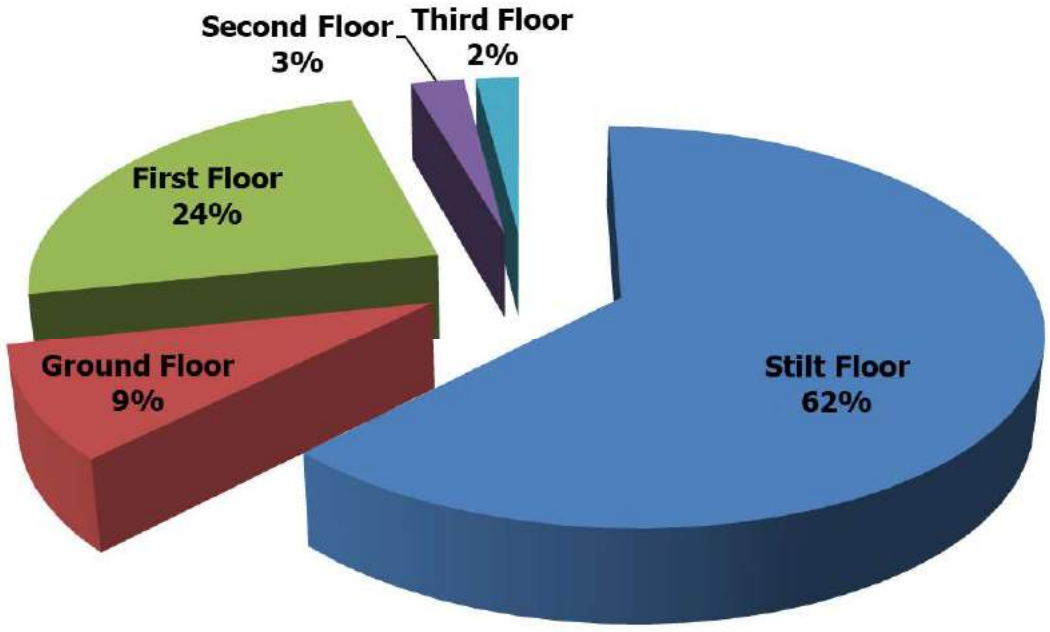


Figure 18: Energy consumed by Equipment floor wise

The above analysis shows the equipment in the **Stilt consumes the highest amount of energy of 67,607 kWh at 62%** the **First floor consumes 25,848 kWh at 24%** whereas the **Ground floor consumes 10,014 kWh at 9%** the **Second floor consumes 2,664 kWh at 3%** and least energy is consumed by **Third floor of 2,160 kWh at 2%**

7.9.5 Site investigation observations

Some of the points noticed are as follows:

1. All Equipments are in working conditions and Daily monitoring and check is done by the maintenance staff and admin staff in an excellent manner.
2. No defect was found in any equipment of electrical consumption.

7.10 Recommendations for a Sustainable Habitat

Over the time energy efficient appliances have been a boon not only to the energy saving parameters they adhere to but also the eco-friendly habits it helps to inculcate. The Institution such as Schools and Colleges are the best way to implement these initiatives. It creates awareness among the students at a young age. The Institutions also act as a symbol and representative of being an energy efficient premise.

Following the analysis we found are some of the suggestions which can be implemented for an energy efficient Institution. This would help in reduction of the current electrical consumption by a major percentage.

7.10.2 Fans

The current Fans are in proper working conditions and maintained well. The ceiling fans are in more quantity and consume at least 60W when in use. These should be replaced with energy efficient fans consuming 32W when in use.

The following graph shows a comparison of the current consumption and consumption of all **265 ceiling fans on all floors** if replaced with star rated appliance.

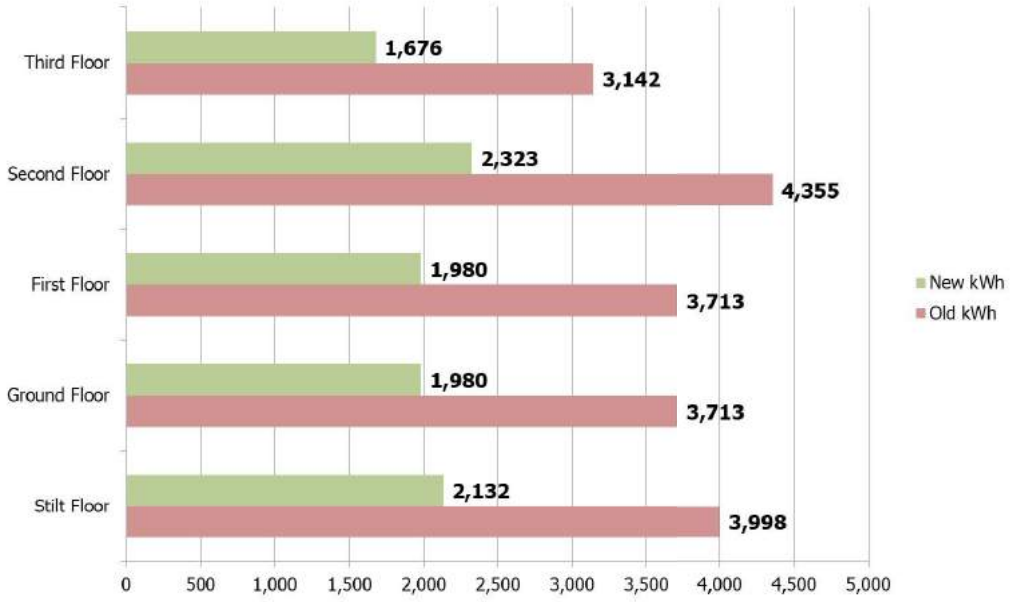


Figure 19: Analysis of current and new fans

The above analysis shows reduction of average of **47% reduction** in energy consumption if replaced with energy efficient appliance. It will be suggested to either replace these now if College can have certain plans else the replacement can be done when fans get damaged or are not in working condition.

7.10.3 AC

The current Air conditioners have become old. Most of these are not star rated and are consuming more energy. These should be replaced with energy efficient and star rated air conditioners wherein regular 1.5 ton AC consumes 1,740W whereas a star rated appliance consumes 1,495W.

The following graph shows a comparison of the current consumption and consumption of all the **45 air conditioners on all floors** if replaced with star rated appliance.

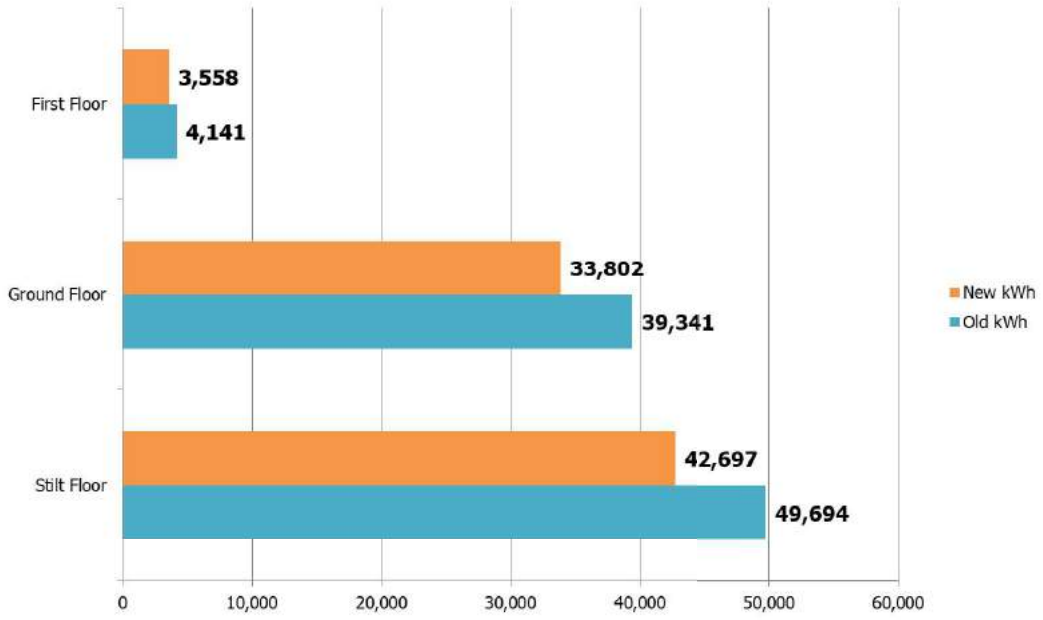


Figure 20: Analysis of current and new air conditioners

The above analysis shows reduction of average of **14% reduction** in energy consumption if replaced with energy efficient appliance.

It will be suggested to either replace these now if College can have certain plans else the replacement can be done when AC gets damaged or is not in working condition.

7.10.4 Equipment

Among all equipment the computers are in maximum number and suggested to be replaced with laptops as this would be energy efficient. A normal computer consumes on an average 200W and it is to be connected all time when it has to be used. On the contrary a laptop consumes 40W and has a battery backup which lasts upto 4 hours.

The following table shows a comparison of the current consumption and consumption of the **352 desktop computers** if replaced with laptops.

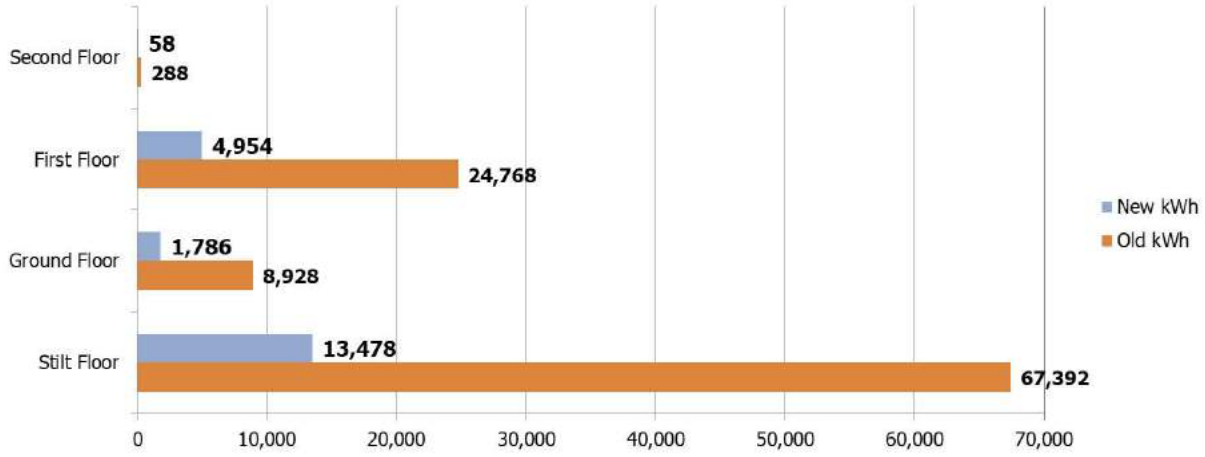


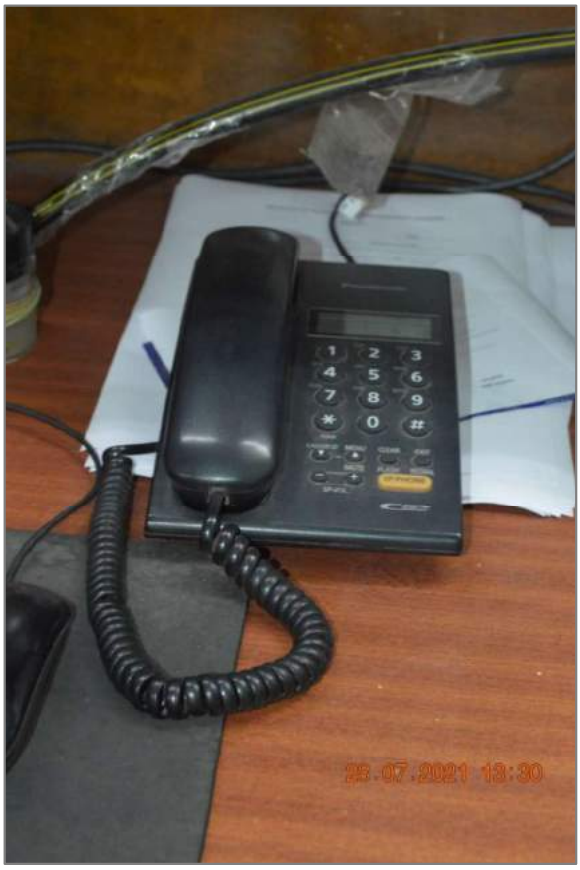
Figure 21: Analysis of current computers and new laptops

The above analysis shows reduction of average of **80% reduction** in energy consumption if replaced with energy efficient appliance.

It will be suggested to either replace these now if College can have certain plans else the replacement can be done when the devices get damaged or are not in working condition.

We would suggest installing a net metering device for better monitoring.


28 07 2021 13 20


1 2 3
4 5 6
7 8 9
* 0 #


28 07 2021 13 19

One of the Electricity bill

MAHAVITARAN
CIN : U40109MH2005SGC153645

Maharashtra State Electricity Distribution Co.

BILL OF SUPPLY FOR THE MONTH OF Jun-2021

GSTIN: 27AAECM2933K1ZB Website: www.mahadiscom.in HSN CODE:

Consumer No. : JALGAON CIRCLE - 590 JALGAON URBAN DIVIS - 594 JALGAON U-II S/DN - 237 BU 4237
Consumer Name : 110014768831
Address : KCESs InstituteofManagement andResearch
Gat No. 7480, IMR Campus JALGAON JALGAON Jalgaon (
M Corp.)
Village : Pin Code : 425001

BILL DATE : DUE DATE : ₹ Bill No: 00000124
IF PAID UPTO 09/07/2021 23/07/2021 ₹ 147200.
IF PAID AFTER 15/07/2021 ₹ 145950.
Last Receipt No./Date 23/07/2021 149040.
Last Month Payment 15-06-2021
Scale / Sector 106480.00

E-mail: infxxxxxxx@electricitybills.net
Mobile No.:
Sanctioned Load (KW) 77xxxx89
Contract Demand (KVA): 150.00 KW
Tariff: 150.00 89 LT-VII B I
Date of Connection: 03/12/2019
Supply at: LT
Prev. Highest (Mth):
Security Deposit Held Rs.: 150000.00
Bank Guarantee Rs. :

Meter No.: 055-X1129510
Connected Load (KW) :
50% of Con. Demand (KW) 150.00 KW 75.00
DTC 2371029 GIS Dtc/Pole
Category: Public Services Other
Elec. Duty: 02 PART A
Prev. Highest Bill Demand (KVA):
Addl. S.D. Demanded Rs.: 0.00
S D Arrears Rs.: 0.00

Activity Medium Scale / Private Sector
Seasonal :
Urban/Rural Flag N / U Express Feeder Flag
Feeder Voltage (KV) : 11
PC-MR-ROUTE-SEQ 00-40-0007-2030
GSTIN:
PAN:

BILLING HISTORY

Bill Month	Units	Bill Demand(KVA)	Bill Amount
May-2021	7774	60	106717.5
Apr-2021	8348	60	112682.5
Mar-2021	9572	60	129521.9
Feb-2021	7516	60	106480.4
Jan-2021	9281	60	125369.3
Dec-2020	7774	60	109733.6
Nov-2020	7583	60	107493.2
Oct-2020	10026	60	150312.6
Sep-2020	9797	60	131865.6
Aug-2020	8413	60	116343.5
Jul-2020	6293	60	93614.54
Jun-2020	29380	60	68287.32

CUSTOMER CARE Toll Free No. 1912,1800-233-3435, 1800 102-3435

Rule & Procedure for Consumer Grievances Redressal is available at www.mahadiscom.in>consumer portal>CGRF

Instead of Printed bill . register for E-bill and avail Rs. 10 per bill as a "Go-green " discount.
For registration visit at www.mahadiscom.in->consumer portal->Quick access->Go-green request

Maintain H distortion limit as pre by IEEE STA 519-19 to avoid p

Avail Po factor inc up to 3 maintainin factor a 95% to 1

Avail load Incent up to 15 maintai constant profil

Avail prompt pa discoun paying within pr payment

For making Energy Bill payment through RTGS/NEFT mode, use following details.
Beneficiary Name: MSEDCL
Beneficiary account no.: MSEDCL01110014768831
IFS Code: SBIN0008965 , Name of Bank : STATE BANK OF INDIA, Name of Branch: IFB BKC
Bill Amount:<As per bill>
Disclaimer: Please use above bank details only for payment against consumer number mentioned in beneficiary account number.
In case of energy bill paid through NEFT / RTGS, date of amount credited in MSEDCL bank account will be considered as bill payment date.

Printed by: ANAND PUBLIC

आता नवीन औद्योगिक वीज जोडणी अधिक सुलभतेने

Ease of doing business

नवीन वीज जोडणीसाठी गरज केवळ दोनच दस्तऐवजाची

* मालकी हक्क / वाहिवाटीचा पुरावा
* जिल्हा उद्योग केंद्राचे प्रमाणपत्र

सर्व प्रक्रिया ऑनलाईन (अर्ज भरणे, डिमांड नोटचा भरणा)

महावि

संपर्क :
महावितरणाच्या www.mahad
या संकेतस्थळावरील ग्राहक से
किंवा महावितरण मोबाईल ॲपचा

Important Message

- Consumers can pay online using Net banking, Credit/Debit cards at https://wss.mahadiscom.in/wss/wss after registration.
- Submit / update your E-mail id and mobile number to Circle Office for receiving prompt alerts through SMS.
- Submit / update your PAN & GSTIN to circle office with copies of PAN & GSTIN for verification.
- Special desk is operational for HT Consumers, please contact: htconsumer@mahadiscom.in for any clarification / query or grievance.
- This Electricity Bill should not be use for the address proof and as a proof of property ownership.
- For any payment to MSEDCL, ENSURE & INSIST for computerized receipt with unique system generated receipt number. Do not ac written receipt. Pay online to avoid any inconvenience.

Greenvio Solutions

8. Towards a Healthy & Sustainable Institution

8.1 Inputs by Greenvio Solutions

Based on the analysis of the study of premises in addition to the recommendations provided in each section of Ecological, Water, Waste and Energy Audit the College can adopt the following strategies towards a Healthy and Sustainable Institution practices.

a) **Terrace farming -** There can be provision of terrace farming alongside the Canteen on Terrace and kitchen garden practices in a designated area of the open space this would enhance the biodiversity and be useful in training students and staff about the healthy practices and vegetables grown which would be used in Canteen. It helps in capacity building as well as the smaller steps taken have huge impacts when each student would adopt these practices in their homes or societies and grow kitchen garden, terrace garden there will be a long term benefit for the environment as a whole.

b) **Cutlery in the Canteen –** The regular plastic and steel plates, spoons used in Canteen can be replaced with eco-friendly and organic leaves, paper straw, disposable plates, edible spoons and tables made out of sugarcane waste or bamboo. This will be first of its kind initiative to be adopted and practiced thus also inculcating the healthy practices in students.

c) **Waste vio –** Stepping up a little further an initiative can be undertaken wherein College can tie up with an organisation and students can be encouraged to collect dry waste and electronic waste such as newspapers, old computers and others and hand over to organisation on a weekly or monthly basis thereby making a waste reduction approach in the community. This has benefits such as awareness, eco-friendly habits in becoming a responsible citizen.

Signages – In addition to the signages being in regular language there can be additional signages in braille language for the specially abled students

8.2 Survey Results

An online survey was conducted to analyse the student and staff views about what changes according to you can be undertaken for Green audit improvement in College premise and activity, some of the key responses are listed below. Whereas many responses **stated there were no changes requires because the present practices are excellent.**

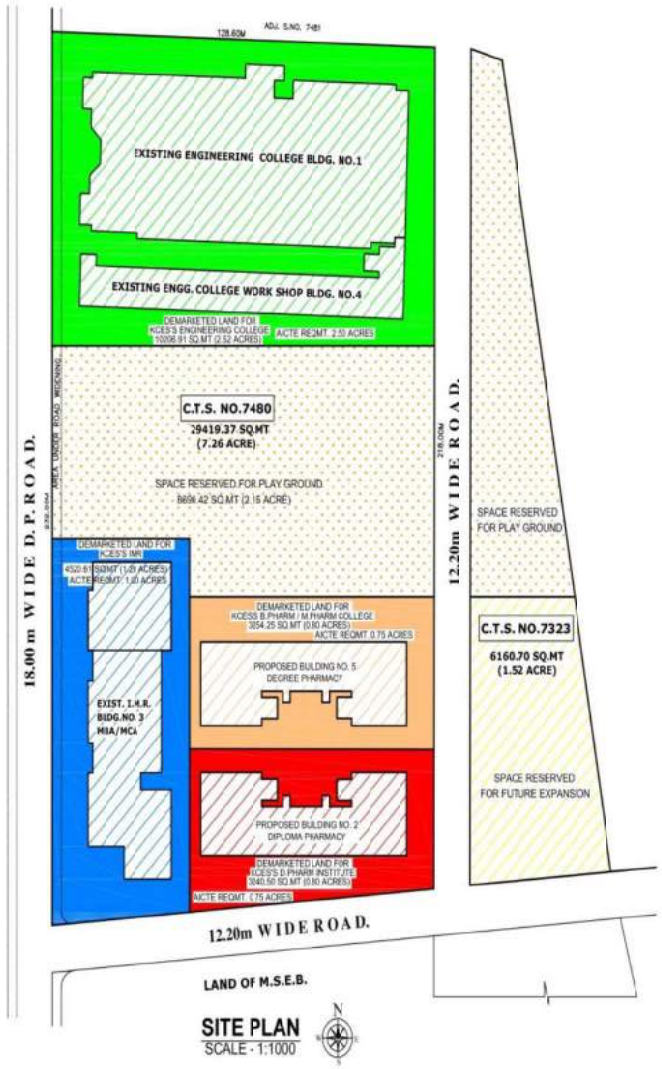
- Need to create horizontal garden
- Planting trees. Water retention and infiltration
- Join a bicycle rental program. Organize a donation program. Start a sustainability convention. Plan out an organic campus garden
- Institute should create their green army i.e students groups who willingly participate to protect environment and spread awareness
- Institution should provide every student with small plants as the token of reward on there achievements in studies or in extra curricular activities held in institution.
- Renovation of cooking system in the canteen to save gas
- According to me undertaken for green audit improvement in college premise and activity changes: to recognize initiative taken by organisation towards environment, to provide baseline information to enable organisation to evaluate and management environmental change threat and risk, to identify and control the impact of activities of organisation on environment, to suggest the best
- Generator usage should be stopped and solar panels should be implemented.
- Changes can be undertaken can be energy conservation, use of renewable sources, rain water harvesting, efforts of carbon neutrality, planting of trees, hazardous waste management and E-waste management.

However, it should be noted that the College has taken up multiple initiatives and because of Pandemic the students have not practically visited the campus so many of these points are not mandatory at the moment.

9. References

1. Uniform Plumbing Code – India, 2008
2. IGBC Green Existing Buildings – Operation & Maintenance (O&M) Rating system, Pilot version, Abridged Reference Guide, April 2013
3. IGBC Green Landscape Rating system, March 2013
4. BOMA Canada Waste Auditing Guide, Best Environmental Standards, BOMA BEST - Canada
5. Climate data https://en.climate-data.org/asia/india/maharashtra/jalgaon-5808/
6. Used only for understanding Universal design - Universal accessibility Guidelines for Pedestrian, Non-motorizes vehicle and Public Transport Infrastructure – Report guidelines by Samarthyam (National centre for Accessible Environments) – an initiative supported by Shakti Sustainable Energy Foundation.

10. Annexure



AREA STATEMENT

TOTAL AREA OF C.T.S.NO. 7480 & 7323 (29,419.37+6,160.70) = 35,580.07 SQ.MT

BLDG. NO.	GROUND FL.	FIRST FL.	SECOND FL.	THIRD FL.	TOTAL AREA
EXIST. & APPR. B/UP AREA OF BLDG. NO.1	3876.94 SQ.M	3731.55 SQ.M	3838.05 SQ.M	3757.39 SQ.M	15143.93 SQ.MT
EXISTING B/UP AREA OF BLDG. NO. 2	622.76 SQ.MT	619.42 SQ.MT	-------	-------	1242.18 SQ.MT
EXIST. & APPR. B/UP AREA OF BLDG. NO.3	837.121 SQ.MT	1378.039 SQ.MT	1378.039 SQ.MT	1381.053 SQ.MT	4969.252 SQ.M
APPROVED B/UP AREA OF BLDG. NO.4	1259.41 SQ.MT	797.36 SQ.MT			2056.77 SQ.M
TOTAL EXISTING B/UP AERA	**6530.231 SQ.M**	**6526.369 SQ.M**	**5216.089 SQ.MT**	**5139.443 SQ.MT**	**23412.132 SQ.M**
EXISTING BLDG. NO.2 TO BE DEMOLISH	622.76 SQ.MT	619.42 SQ.MT	-------	-------	1242.18 SQ.MT
TOTAL EXISTING B/UP AERA	**5907.471 SQ.M**	**5906.949 SQ.M**	**5216.089 SQ.MT**	**5139.443 SQ.MT**	**22169.952 SQ.M**
PROPOSED B/UP AREA OF NEW BLDG. NO.2	984.60 SQ.MT	1293.70 SQ.MT	1293.70 SQ.MT 4th FLOOR 5th FLOOR	1293.70 SQ.MT 1293.70 SQ.MT 1293.70 SQ.MT	7453.10 SQ.M
PROPOSED B/UP AREA OF BLDG. NO. 3	428.37 SQ.MT	630.80 SQ.MT	732.86 SQ.MT 3rd FLOOR	732.86 SQ.MT 2114.913 SQ.MT	4639.803 SQ.M
PROPOSED B/UP AREA OF NEW BLDG. NO.5	984.60 SQ.MT	1293.70 SQ.MT	1293.70 SQ.MT 4th FLOOR 5th FLOOR	1293.70 SQ.MT 1293.70 SQ.MT 1293.70 SQ.MT	7453.10 SQ.M
TOTAL EXIST. + APPR. + PRCP. B/UP AREA	**8395.041 SQ.M**	**9125.149 SQ.M**	**8536.349 SQ.MT**	**15749.416 SQ.MT**	**41715.955 SQ.M**

AREA STATEMENT

TOTAL AREA OF C.T.S.NO. 7480	= 29419.37 SQ.M
TOTAL AREA OF C.T.S.NO. 7323	= 4665.24 SQ.M
TOTAL AREA OF C.T.S.NO. 7480+7323	= 34084.61 SQ.M
LESS PLAY GROUND AREA OF CAMPUS 10%	= 13633.84 SQ.M
REMAINING AREA OF PLOT 60%	= 20450.77 SQ.M
TOTAL PERMISSIBLE B/UP AREA OF CAMPUS (1.20) 20450.77 X TWO = 40901.54 SQ.MT	= 40901.54 SQ.M
TOTAL EXIST.+APPR.+PROP. B/UP AREA	= 41715.95 SQ.M
F.S.I. CONSUMED	= 1.02
BALANCE B/UP AREA	= 980.129 SQ.M

APPROVING AUTHORITY

OWNERS SIGNATURE

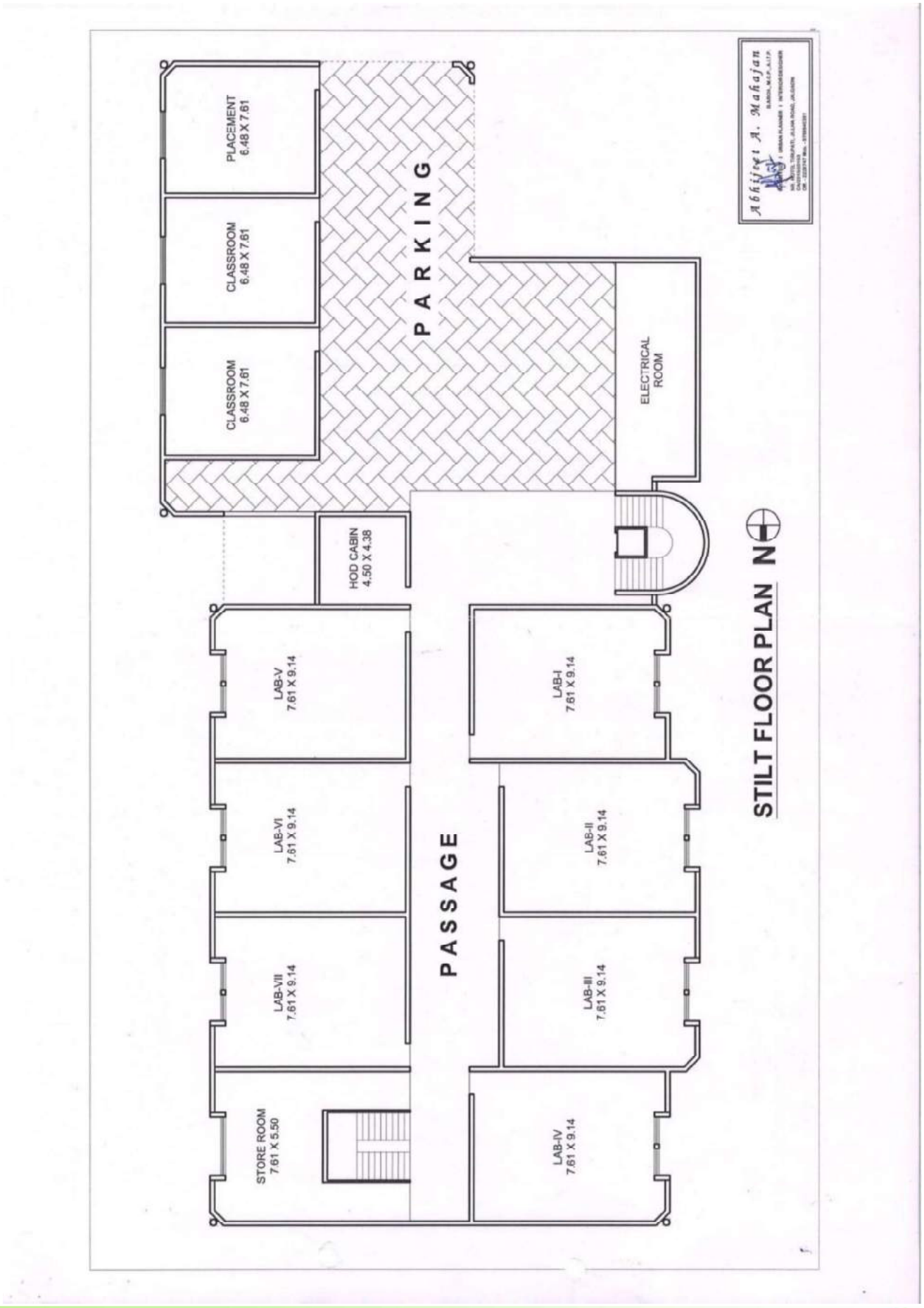
MASTER PLAN SHOWING THE LAYOUT OF THE BUILDINGS AND AREA ALLOCATION AT C.T.S. NO. 7480 & 7323 OF JALGAON, TAL & DIST. JALGAON

FOR - K.C.E. SOCIETY'S GROUP OF INSTITUTION

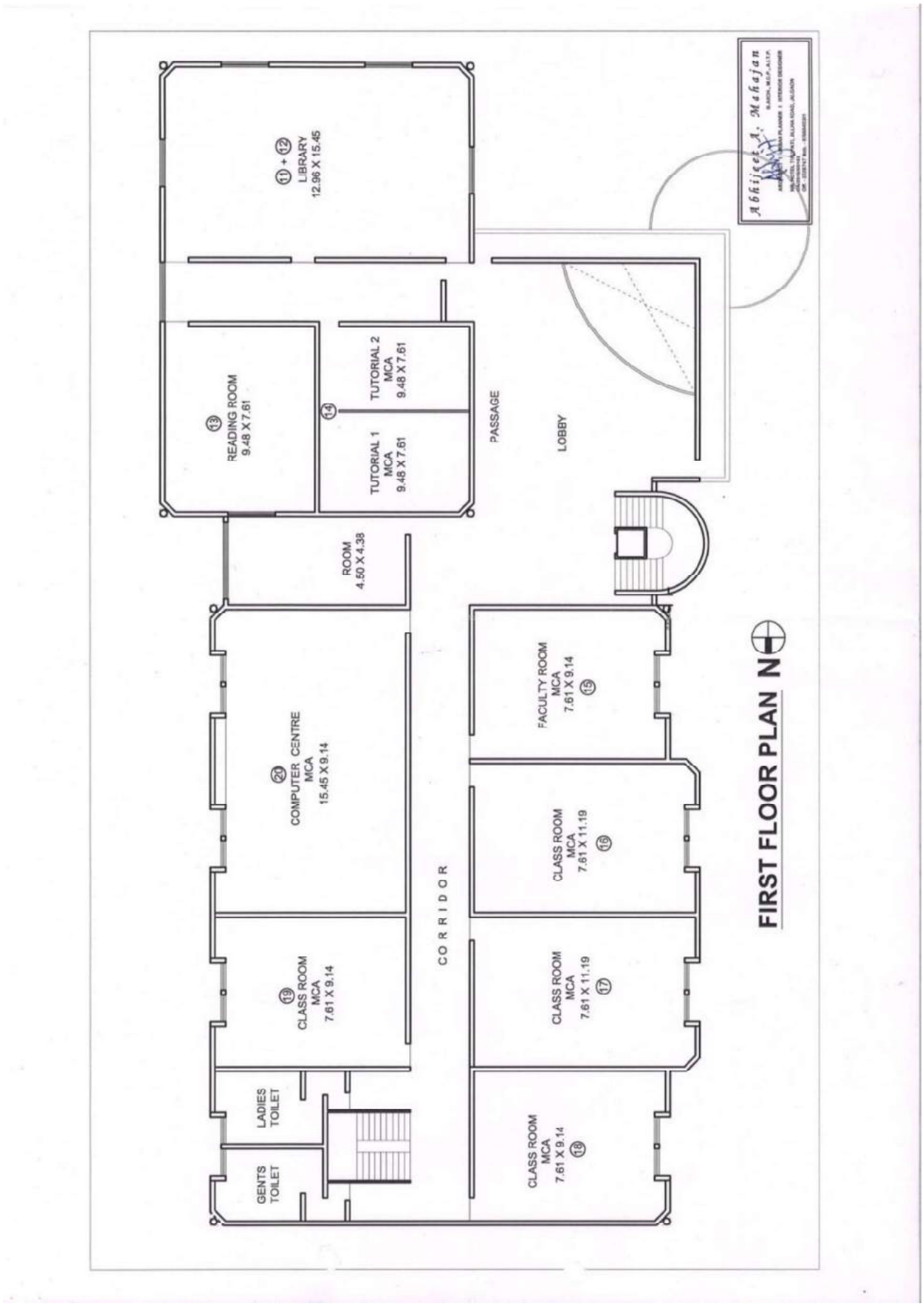
JOB NO.	
DRG NO.	
SCALE	AS SHOWN
DRAWN BY	AAM
DATE	19.09.2011
CHEKED BY	Ar. A.A.M.

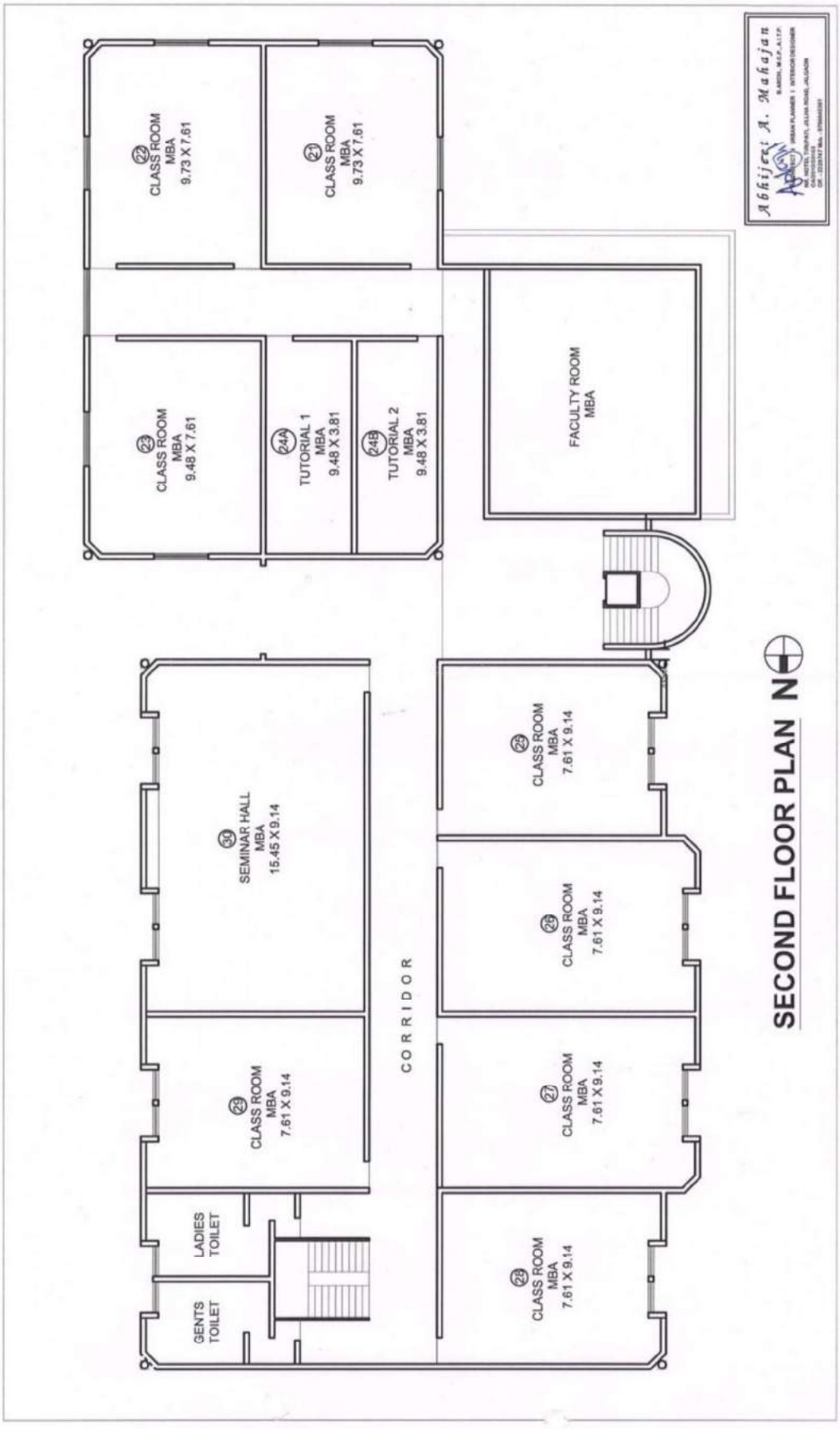
ARCHITECT

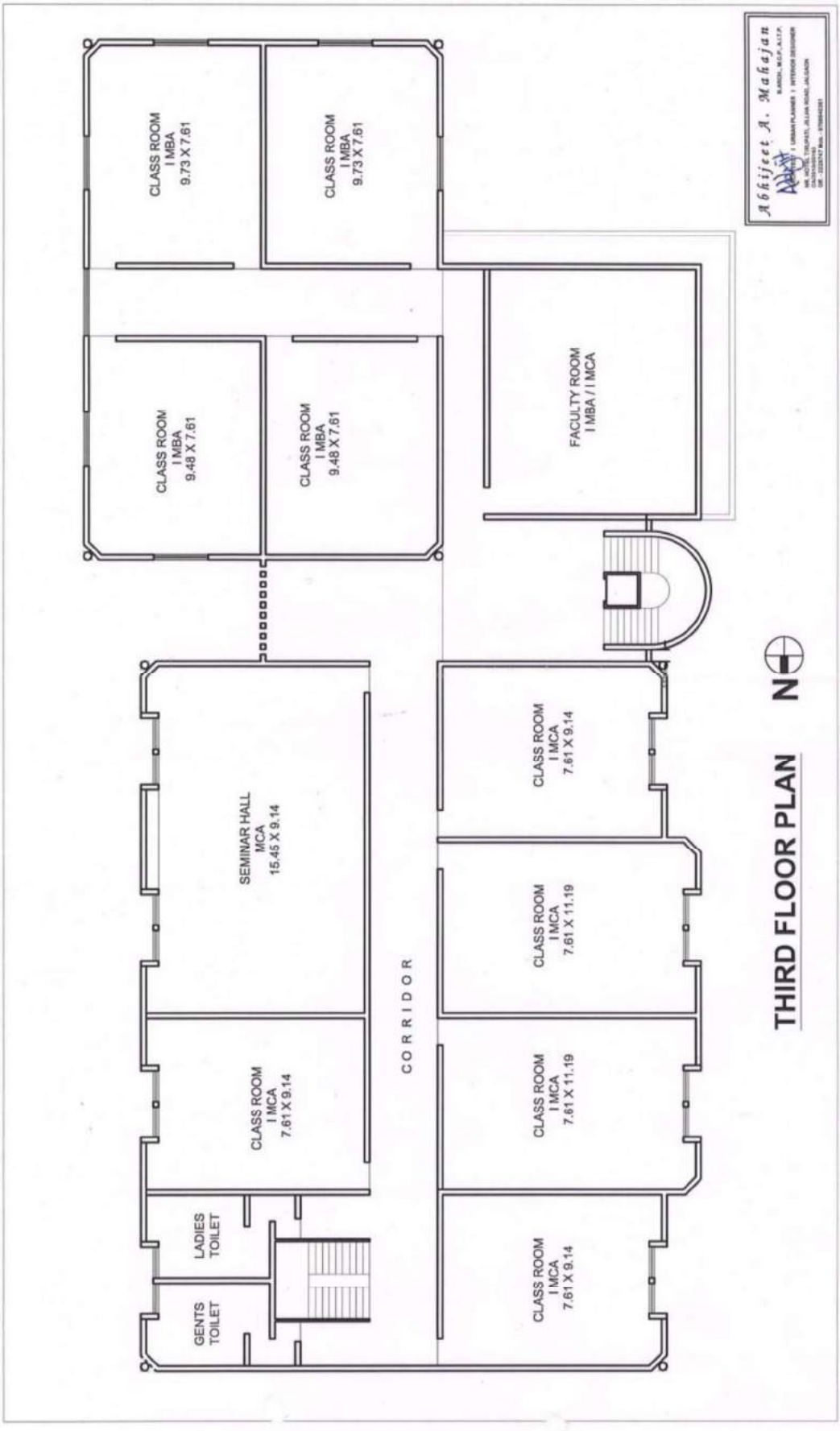
Abhijeet A. Mahajan
B.ARCH M.C.P.
ARCHITECT | URBAN PLANNER | INTERIOR DESIGNER
HOTEL TIRUPATI, JILLHA ROAD, JALGAON
Off. -2226747 Mob. - 9766645361
CA/2010/50153

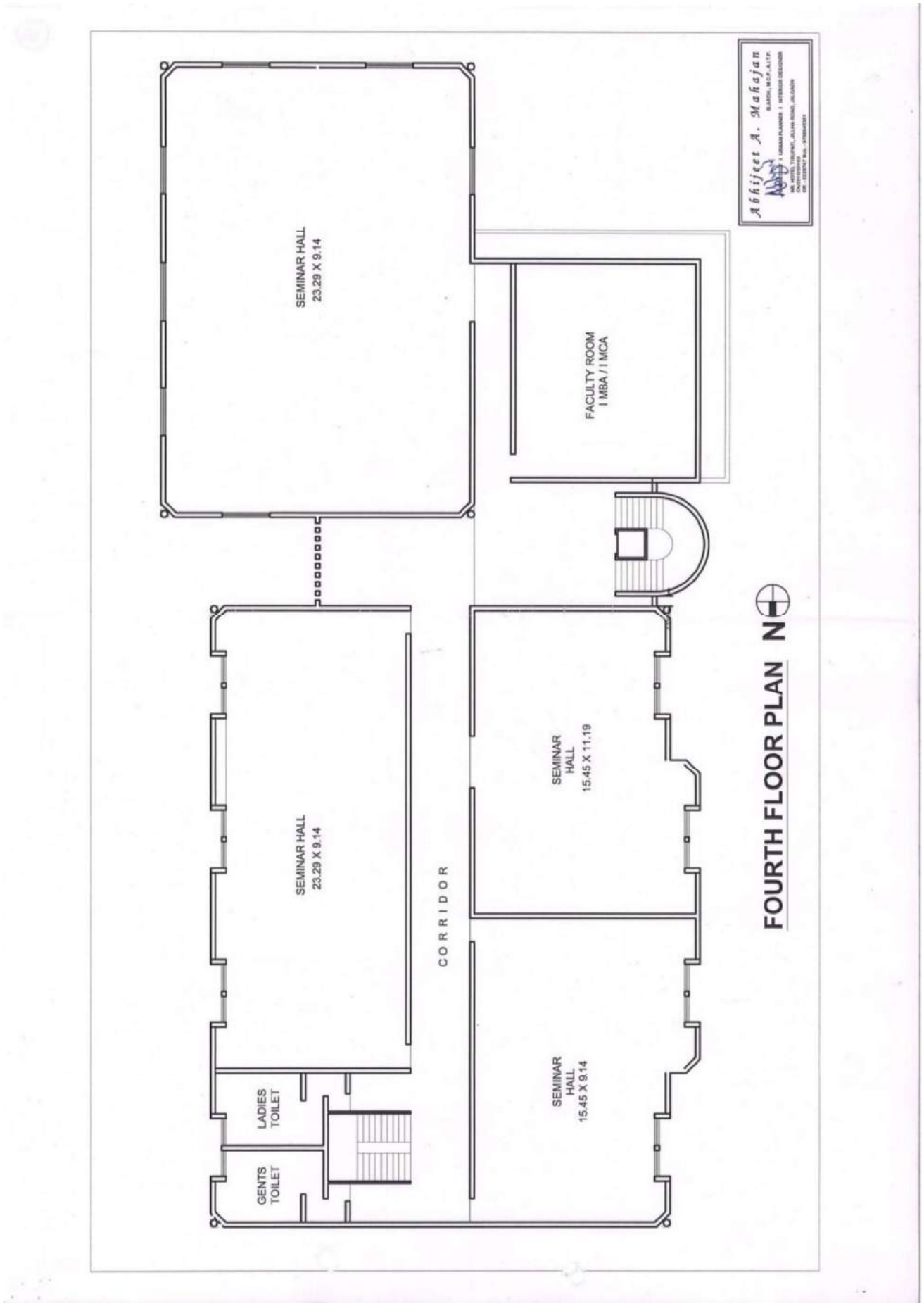

PLACEMENT
6.48 X 7.61
CLASSROOM
6.48 X 7.61
CLASSROOM
6.48 X 7.61
PARKING
ELECTRICAL
ROOM
HOD CABIN
4.50 X 4.38
LAB-V
7.61 X 9.14
LAB-I
7.61 X 9.14
LAB-VI
7.61 X 9.14
LAB-II
7.61 X 9.14
PASSAGE
LAB-VII
7.61 X 9.14
LAB-III
7.61 X 9.14
STORE ROOM
7.61 X 5.50
LAB-IV
7.61 X 9.14
STILT FLOOR PLAN
N


GROUND FLOOR PLAN
N
② DIRECTOR OFFICE 6.34 X 7.61
① ADMIN. OFFICE 9.73 X 7.61
PANTRY
TOI.
RECEPTION
③ ADMIN. OFFICE 9.73 X 7.51
④ ADMIN. OFFICE 9.73 X 7.51
ENTRACE FOYER
EXAM CONTROL OFFICE REPROGRAPHY 4.50 X 9.14
⑤ HOD CABIN MBA & MCA DEPT. 7.61 X 9.14
⑩ AUDITORIUM HALL 15.45 X 9.14
⑥ CONFERENCE 7.61 X 11.19
CORRIDOR
⑨ GIRL'S COMMON ROOM 7.61 X 9.14
⑦ BOYS COMMON ROOM 7.61 X 11.19
LADIES TOILET
⑧A FIRST AID SEEKROOM 3.74X8.14
GENTS TOILET
⑧B STORE MAINTENANCE HOUSEKEEPING 3.74X8.14


⑪ + ⑫
LIBRARY
12.96 X 15.45
⑬
READING ROOM
9.48 X 7.61
⑭
TUTORIAL 2
MCA
9.48 X 7.61
TUTORIAL 1
MCA
9.48 X 7.61
PASSAGE
LOBBY
ROOM
4.50 X 4.38
⑳
COMPUTER CENTRE
MCA
15.45 X 9.14
FACULTY ROOM
MCA
7.61 X 9.14
⑮
CLASS ROOM
MCA
7.61 X 11.19
⑯
⑲
CLASS ROOM
MCA
7.61 X 9.14
CORRIDOR
CLASS ROOM
MCA
7.61 X 11.19
⑰
LADIES
TOILET
GENTS
TOILET
CLASS ROOM
MCA
7.61 X 9.14
⑱
FIRST FLOOR PLAN
N


SECOND FLOOR PLAN
N
CLASS ROOM MBA 9.73 X 7.61
CLASS ROOM MBA 9.73 X 7.61
CLASS ROOM MBA 9.48 X 7.61
TUTORIAL 1 MBA 9.48 X 3.81
TUTORIAL 2 MBA 9.48 X 3.81
FACULTY ROOM MBA
SEMINAR HALL MBA 15.45 X 9.14
CLASS ROOM MBA 7.61 X 9.14
CLASS ROOM MBA 7.61 X 9.14
CLASS ROOM MBA 7.61 X 9.14
CLASS ROOM MBA 7.61 X 9.14
CLASS ROOM MBA 7.61 X 9.14
CORRIDOR
LADIES TOILET
GENTS TOILET


CLASS ROOM
I MBA
9.73 X 7.61
CLASS ROOM
I MBA
9.73 X 7.61
CLASS ROOM
I MBA
9.48 X 7.61
CLASS ROOM
I MBA
9.48 X 7.61
FACULTY ROOM
I MBA / I MCA
SEMINAR HALL
MCA
15.45 X 9.14
CLASS ROOM
I MCA
7.61 X 9.14
CLASS ROOM
I MCA
7.61 X 11.19
CLASS ROOM
I MCA
7.61 X 9.14
CLASS ROOM
I MCA
7.61 X 11.19
CLASS ROOM
I MCA
7.61 X 9.14
CORRIDOR
LADIES
TOILET
GENTS
TOILET
N
THIRD FLOOR PLAN


SEMINAR HALL
23.29 X 9.14
FACULTY ROOM
I MBA / I MCA
SEMINAR HALL
23.29 X 9.14
CORRIDOR
SEMINAR
HALL
15.45 X 11.19
SEMINAR
HALL
15.45 X 9.14
LADIES
TOILET
GENTS
TOILET
FOURTH FLOOR PLAN
N


Institute of Management & Research