

Elion Technologies & Consulting Pvt Ltd

Certificate

This is to certify that Green Audit at **Annamachayara Institute Of Technology & Science, Piglipur, Blatasingaram, Hayathnagar, Hyderabad, Telangana, 501512** was carried out for the year **2019 - 20**.

The college has provided the requisite data and credentials for examination. The activities and steps undertaken by the college have been validated. The college's endeavors in the realm of environmental preservation and sustainability are recognized and lauded.

Audit Date – 10/01/2020
Valid Up to – 09/01/2021


Audit Officer



Certificate Number
GA/2020/AITS



**GREEN AUDIT REPORT
FOR
ANNAMACHAYARA INSTITUTE OF
TECHNOLOGY & SCIENCE**



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Acknowledgment

Elion Technologies and Consulting Pvt Ltd places on record it's thanks to Annamacharya Institute of Technology & Science Institute of Management for entrusting the task of conducting green audit study.

We acknowledge with gratitude the whole hearted support and cooperation extended by all team members while carrying out the study.



Site Information

| | |
|------------------------------|---|
| Name of College | Annamacharya Institute of Technology & Science |
| College Address | Piglipur, Blatasingaram, Hayathnagar, Hyderabad, Telangana, 501512 |
| Execution Partner | ELION Technologies & Consulting Pvt Ltd |
| Communication Address | 307, 3rd Floor DDA Lal Market H-Block Vikas Puri, New Delhi, 110018 |
| Date of Audit | 10 th January 2020 |
| Year of Audit | 2019 – 2020 |
| Audit Participants | Mr. P V Krishna Murthy |
| Total College Area | 10 Acres |
| Total Green Area | 8 Acres |



Overview of Institute

Sri. C. Gangi Reddy garu, Hon' Secretary of Annamacharya Educational Trust. He was born in the year 1954 to Choppa Narayana Reddy and Choppa Rajamma, a farmers family in Siddulapally, very close to Thallapaka the birth place of saint poet Annamacharya. He completed his initial education in Thallapaka and then went to Sri Govindarajaswamy Degree College, Tirupathi where he completed his graduation in B.Com. He got his Post Graduate degree Master of Commerce from Sri Venkateswara University, Tirupati in the year 1977. He completed LLB in 1981 through evening college from Osmania University. He started his official career in the department of agriculture immediately after post-graduation through APPSC Hyderabad but having got selected through APPSC Group-II immediately joined as Sub Register in the registration department of AP Government.

He took a decision to establish the Annamacharya Educational Trust in the year 1997 with a number of his well-wishers as the members of the trust, he himself being the Hon' Secretary in the educational trust. Established an engineering college by name Annamacharya Institute of Technology and Sciences in the year 1998 at Rajampet, Annamacharya College of Pharmacy in the year 2001, Annamacharya College of Education also in the same year on the Rajampet campus.

Annamacharya Institute of Technology and Sciences at Piglipur, Hyderabad was started in the year 2005 and one Engineering college by the same name at Tirupati in the year 2007. Another Engineering college by the same name Annamacharya Institute of Technology and Sciences started at Kadapa in the year 2010.

Dr.C.Ramachandra Reddy, a practicing children specialist in Rajampet is the chairman of Annamacharya Educational Trust, the sponsoring organization of the institute. He extends his services as the chief medical officer for AITS.

List of courses offered by the institute:

Following are the list of courses offered by the institute-

- Computer Science Engineering
- Electronics & Communication Engineering
- Electrical & Electronics Engineering
- Mechanical Engineering
- CSE (AIML)
- CSE (DS)
- MBA
- MCA
- Diploma



Introduction

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of institute. It aims to analyse environmental practices within and outside of the concerned place, which will have an impact on the eco-friendly atmosphere. Green audit is a valuable means for a college to determine how and where they are using the most energy or water or other resources; the college can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students' better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO₂ from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through carbon footprint reduction measures.

Advantages of Green Audit:

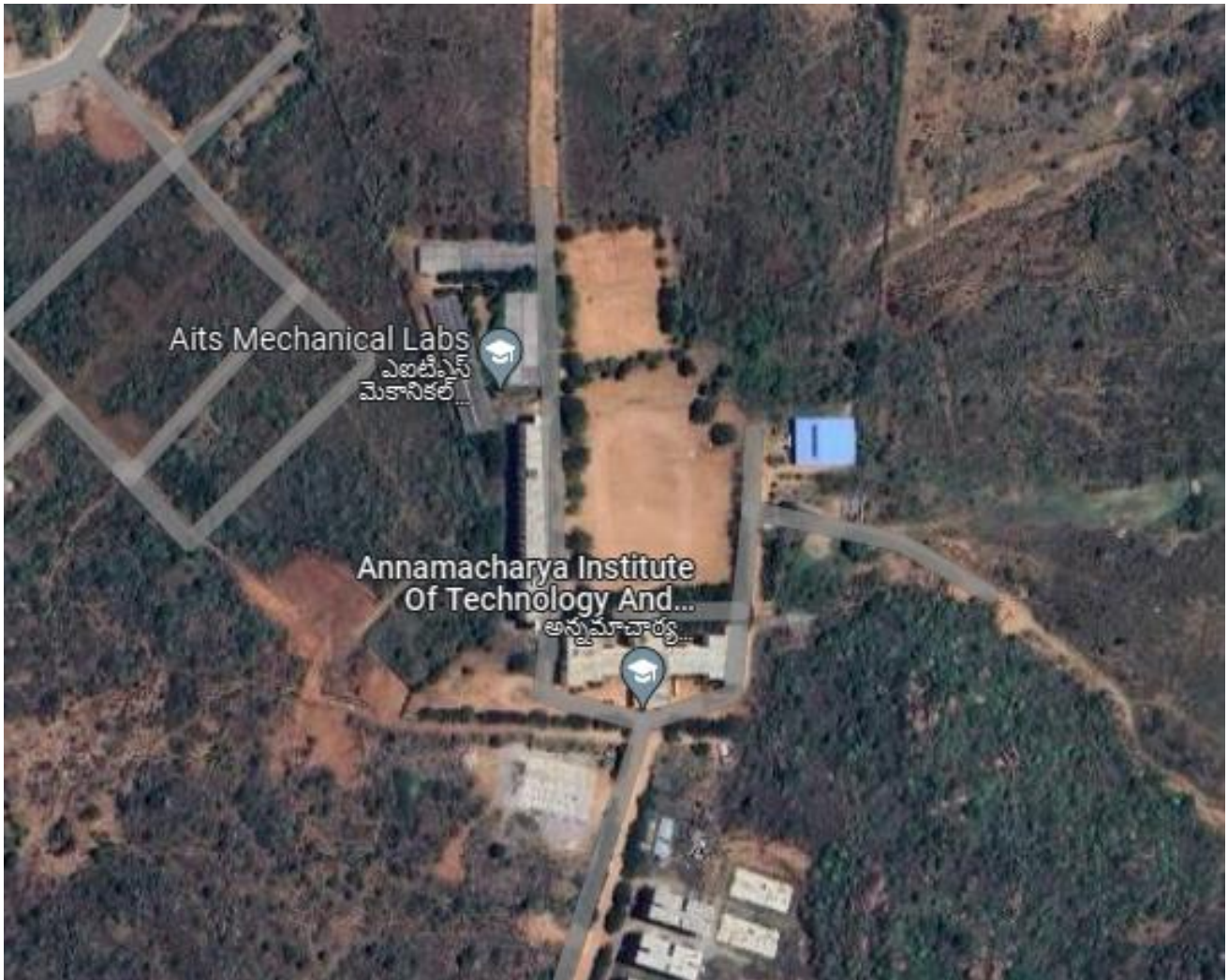
Green Audit is assigned to the Criteria 7 of NAAC, National Assessment and Accreditation Council which is a self-governing organization of India that declares the institutions as Grade A, Grade B or Grade C according to the scores assigned at the time of accreditation. Some main advantages of green Audit are:

- It helps to shield the environment.
- Minimizing the waste and managing the cost.
- Authenticate conformity with the implemented laws.
- Minimizing the energy consumptions and focus on green and clean energy.
- Ambient Environmental Condition.
- Awareness and Training on Sustainability for Students.
- Awareness about environmental guidelines and duties.

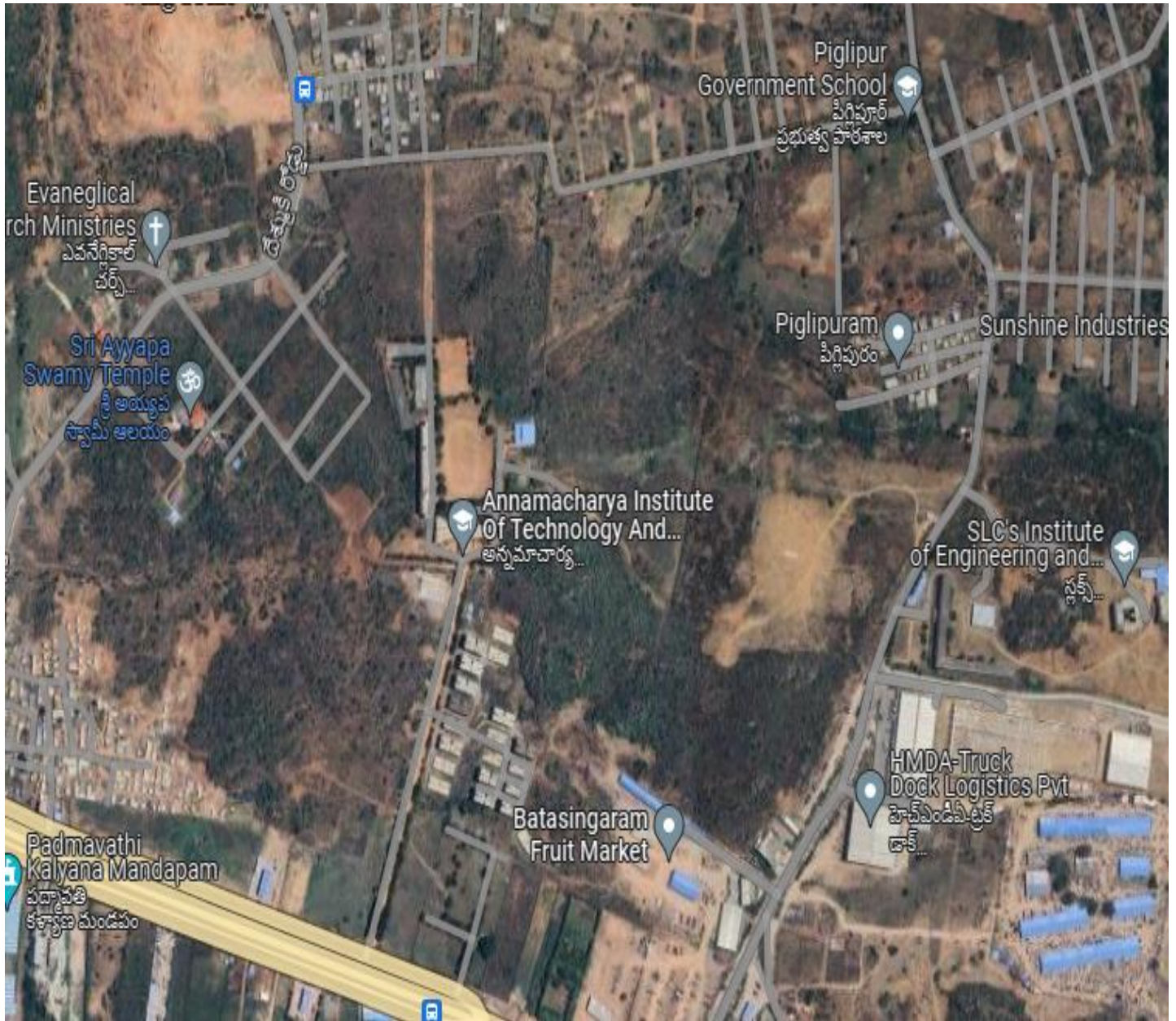


Environment Setting

The land use around the campus is mix of commercial and institutional use. Other institutes, Schools, Temples, Commercial warehouses etc are present around the campus.



Annamacharya Institute of Technology & Science



Location of Annamacharya Institute of Technology & Science



Green Audit

For Green Audit following 13 major areas (including their subsections) were covered and compliance/ initiatives under these areas were verified/ validated.

- a) Good Daylight Design and Ventilation
- b) Water Efficiency
- c) Wastewater Management
- d) Indoor Air Quality
- e) Energy Efficiency
- f) On-site Energy Generation
- g) Temperature and Acoustic Control
- h) Paper Waste Management
- i) E-Waste Management
- j) Canteen and Solid Waste Management
- k) Universal Access and Efficient Operation and Maintenance of Building
- l) Green Belt
- m) Green Programs (Green initiatives)

3.1 Good Daylight Design and Ventilation

- a) Corridors are wide with good ceiling height. All the corridors receive good daylight.
- b) Classrooms and Library have large windows. Adequate daylight is received through the windows during daytime.
- c) Classroom walls, corridors and other areas are white-washed, this enhances the daylight received.
- d) Curtains are provided on some of the windows to avoid glare.
- e) Stair cases receive daylight through windows provided at various levels.

3.2 Water Efficiency:

- a) Groundwater supply is the source of water supply in the campus. Ground water stored in a mini dam.
- b) Water coolers are provided for drinking water on the top floor having capacity of 500 liters separately in A & B blocks. From there, water is supplied to each floor.
- c) Normally mops are used for floor cleaning and hose is used for cleaning once a week.
- d) Water conservation faucets are used in the washrooms.
- e) Dual flushing system is provided in the washrooms. The dual-flush toilet typically uses less water, resulting in lower running costs and a lower



environmental impact.

- f) Signages are provided in washrooms emphasizing water conservation.
- g) Water from air conditioning unit and reject water from water purifiers is collected in the tanks or buckets. Further, this water is use for tree plantation and gardening purpose.
- h) Rain water harvesting system is available and rainwater is stored in a tank and reused further as and when required.

3.3 Wastewater Management:

- a) Water treatment plant or water recycling plant is not available in the campus. It is recommended to install sewage treatment plant as Sewage treatment plants (STPs) play a crucial role in water conservation by treating and recycling wastewater, making it suitable for reuse in various non-potable applications. This reduces the demand for freshwater resources and alleviates pressure on stressed water supplies.

3.4 Indoor Air Quality;

Indoor Air Quality (IAQ) refers to the air quality within and around buildings and structures, as it relates to the health and comfort of building occupants. Some common indoor pollutant are listed as below:

- Molds and other allergens – This may arise from water seeping into the building envelope or skin, plumbing leaks, condensation due to improper ventilation, or from ground moisture penetrating a building part.
- Carbon monoxide – Sources of carbon monoxide are incomplete combustion of fossil fuels.
- Volatile organic compounds (VOCs) – VOCs are emitted by paints and lacquers, paint strippers, pesticides, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions etc.
- Carbon dioxide – Due to human respiration
- Particulate matter – Due to construction and maintenance activities

Major observations under indoor air quality are as below:

- a) Window Air Conditioners are used in the classrooms, labs, seminar hall etc.
- b) Indoor plants are provided in the College. Indoor plants can be plotted not only for the aesthetic appearance but also for health benefits. Refer Annexure 1 for details.
- c) Indoor air quality tests are not carried. It is recommended to get air quality tested once a year.



3.5 Energy Efficiency:

Power is supplied by local distribution company. The major electricity consuming equipment installed in the campus are Air Conditioners, Water Coolers, Lighting, Desktop, Printers, electrical & mechanical lab machines etc.

It was observed that:

- a) LED lights are being used in the campus in place of conventional lights which reduces the energy consumption.
- b) Campus has air conditioners which are in good working condition.

3.6 On Site Energy Generation (usage of LPG/ Natural Gas):

- a) LPG gas is used for cooking purpose.
- b) Back Up diesel generator of 125KVA is available in the campus.

3.7 Temperature and Acoustic Control

- a) White washed rooms & corridors and white/off-white flooring improve the lighting conditions.
- b) The campus has done tree plantation all around the campus.
- c) There is no noise pollution inside and around the campus.

3.8 Paper Waste Management:

Being academic institution, waste paper is the main solid waste generated in the premises. The College has taken steps to minimize and avoid paper usage.

It was observed that:

- a) Prints and photocopies are taken on both sides of the pages to avoid excess paper usage. Rather than photocopy, digitalization (scanning) is practiced.
- b) Internal notices and communications are through E-mail/Whatsapp.
- c) Faculty and administration staff uses old papers and envelopes for internal usages as rough work, file markers, page separators etc.
- d) Old papers and answer sheets are kept in a separate storage room and disposed off as and when required.

3.9 E-Waste Management:

- a) E-waste is directly sold to the local vendors when required.



3.10 Solid Waste Management:

It was observed that:

- a) Wet waste and dry waste segregation is practiced in the premises. Separate bins are provided for wet biodegradable and dry recyclable waste.
- b) Waste is dumped in the dump yard present in the campus.

3.11 Universal Access and Efficient Operation and Maintenance of Building:

It was observed that:

- a) College is easily accessible. Staircase and ramps are provided for staff and students.
- b) Since the access and staircases are wide and uncluttered, it is possible to have a safe evacuation during emergency.
- c) Fire extinguishers and Smoke detectors are provided for emergency. They are inspected and serviced by fire protection Service Company annually.
- d) Directional exit signages and floor markings are present on every floor of the campus.
- e) Regular Fire Safety Trainings is given to staff and students on annual basis.



Ramps provided

3.12 Green belt/ Landscaping:

- a) Large trees and plants are planted in the premises. Plantation also helps maintaining lower temperatures of the area.

3.13 Green Initiatives:

College is regularly celebrating important days such as Environment Day, Yoga Day, Earth Day etc. as well as other cultural programs.



Recommendations/Suggestions

For Improving Energy Consumption:

- a) Every classroom and lab with central switch board can have a diagram linking location of a tube light, fan etc. with corresponding switch. This will ensure that correct fitting is switched on/ off and can save time & unnecessary operation.
- b) Installation of automatic lights with sensors can be considered.
- c) Standard Operation Procedures (SOPs) should be prepared and followed for green purchasing. Equipment with star rating, using eco-friendly materials; with safe disposal policy to be preferred. Policy of returning equipment at the end of life span to the supplier to be preferred.
- d) For purchasing new electronic appliances, star rating provided by Bureau of Energy Efficiency (BEE) should be considered. The equipment which has maximum star ratings could be purchased, which will consume less energy, ensure environmental sustainability and also operate at low cost.
- e) Usage of light reflectors is recommended as the reflectors can spread light to relatively large areas.
- f) If possible, computers should be switched off from main power connections.
- g) Notices/signages can be put up/displayed near switches and on notice boards, informing students and staff to switch off all electricals when not in use.
- h) Control sensors can help to reduce consumption by automatically dimming lights when people are not around, and keeping blinds open to use natural light & reduce energy consumption.
- i) Raise awareness:
 - Encourage students to help in monitoring energy consumption & implement corrective actions
 - Integrate energy education into classroom learning.

Water Conservation:

- a) Provide information on water usage and savings to students/ staff through notices, screen savers in computer labs.
- b) Dry sweep or use a sponge broom when possible, instead of using a hose to clean floors, sidewalks, or other hard surfaces.
- c) Minimize/ reduce water usage by installing water saving faucets such as pressmatic taps, tap aerators, jet sprays etc.
- d) Installation of waterless urinals can be considered to reduce water consumption.
- e) Water balance diagram can be prepared to quantify the water consumption by installing water meters at key points. Based on data gathered, appropriate measures can be taken to reduce the water consumption.



Paper and other Solid Waste Reduction:

- a) Inventories of all solid waste generated in the premises must be maintained.
- b) Enhance recycling. This can be done by creating a group where students can recycle books, personal clothes and other material to needy students. This can be an initiative under green program.
- c) Standard Operating Procedures (SOP) for Solid and E-waste management and for recycling of waste should be prepared & practiced. The SOP's may include collection, segregation and reuse of different types of wastes, if any (e.g. biodegradable waste for composting). This will help in safe disposal of waste to recycle agencies.
- d) Training as well as awareness programs should be organized on segregation of biodegradable waste and recycling of waste. Efforts should be taken to inform students about recycling options and signs should be posted on appropriate bins indicating what could be dumped in each bin.
- e) The college can introduce online app, which can be useful for conducting internal exams, assignment/ reports submission. This system can also be used for displaying important notices, timetables.
- f) Paper usage shall be monitored to understand the impact of digitization in the facility.




Others:

- a) Environmental advisory committee could be formed. The discussions/ information sharing among different departments can generate lot of ideas and awareness on green issues.
- b) Maintain minutes of meetings of environmental committees; evaluate the effectiveness of various environmental programs conducted by the institutes. Set annual targets for Green Initiatives & monitor them closely. Create 'Green Champions'.
- c) Since each student uses computer lab, the screen savers can be set up for creating environmental awareness. (Ergonomics, water conservation etc.). Short 30 second pop up can be displayed on computer screens when they are on standby mode. Or wallpapers informing students about environment conservation can be created.
- d) Consider detailed energy audit (energy consumption, thermal emission, visual comfort) and water audit.
- e) Adopt environmentally responsible purchasing policy, and work towards creating and implementing a strategy to reduce environmental impact of its purchasing decision.







Annexure 1 – Indoor Gardening Details





Indoor plants are commonly used for their aesthetics benefits but they also have vital role reducing airborne pollution. The right choice of plants can be an excellent way of improving indoor air quality and general health. Local landscape contractor can be contacted for supply and rotation of these plants.

| Plants | VOC it removes | Indoor source of VOC's | Plant care |
|---|---|---|---|
|  Aloe Vera | Formaldehyde, Trichloroethylene and Benzene | Chemical based cleaners and paints | Easy to grow with enough sunlight |
|  Bamboo Plant | Formaldehyde, Trichloroethylene and Benzene | Paints, Plastics, Wood products etc. | Thrives under low light conditions as well as easy to maintain |
|  Chinese Evergreen | Benzene | Paints | Low maintenance plant that prefers low light conditions. |




| | | | |
|--|--|--|--|
|  <p>English Ivy</p> | <p>Formaldehyde, Benzene, Air borne fecal matter particles</p> | <p>Wood, Paper products, Air borne fecal – matter particles from pests</p> | <p>Easy to maintain</p> |
|  <p>Janet Craig</p> | <p>Formaldehyde, Benzene and Trichloroethylene</p> | <p>Paints, Plastics, Wood products etc.</p> | <p>Medium to low light tolerant plant. Requires little water for growth.</p> |
|  <p>Golden Pothos or Devils Ivy</p> | <p>Formaldehyde, Cleanses air</p> | <p>Exhaust fumes, carpeting materials, panelling and furniture products made with particle board</p> | <p>Extremely easy to maintain under low to bright light conditions. Fast growing and grows well under Fluorescent light.</p> |
|  <p>Mass Cane</p> | <p>Formaldehyde, benzene and trichloroethylene</p> | <p>Paints, Plastics, Wood products etc.</p> | <p>Medium to low light tolerant plant. Requires little water for growth.</p> |



| | | | |
|---|--|--|---|
|  <p>Snake plant</p> | <p>Formaldehyde and trichloroethylene</p> | <p>cooking fuels, wood products, facial tissues, personal care products and waxed papers</p> | <p>Drought resistant and Tolerates a variety Of light conditions. Hard to damage or kill.</p> |
|  <p>Peace Lily</p> | <p>Formaldehyde, benzene and trichloroethylene</p> | <p>Paints, Plastics, Wood products etc.</p> | <p>Relatively easy to maintain. Survives in low light conditions.</p> |
|  <p>Red-edged Dracaena</p> | <p>Formaldehyde and trichloroethylene</p> | <p>cooking fuels, wood products, facial tissues, personal care products and waxed papers</p> | <p>Drought resistant and Tolerates a variety of light conditions. Hard to damage or kill.</p> |
|  <p>Spider Plant</p> | <p>Formaldehyde, benzene, carbon monoxide and xylene</p> | <p>cooking fuels, wood products, Printing</p> | <p>Easy to maintain under medium to bright light condition.</p> |



| | | | |
|---|---------------------|---|------------------|
|  | Purifies indoor air | - | Easy to maintain |
|---|---------------------|---|------------------|

Parlor Palm



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DISCLAIMER

All information contained in this report is based on the data available and observations made during the audit. All recommendations made in this audit report should be duly evaluated by the management before implementation.

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