Green Aura

Built Environment Sustainability & Transformation

GREEN AUDIT REPORT | 2022

M. S. Ramaiah University of Applied Sciences

2022-23

MSME
MICRO, SMALL & MEDIUM ENTERPRISES
सूक्ष्म, लघु एवं मध्यम उद्यम

Green Aura
Built Environment Sustainability & Transformation

692F,12TH A CROSS BEL LAYOUT, BENGALURU- 560091
(Ministry of MSME registered organisation)

Certificate of Green Audit

THIS CERTIFICATE IS PRESENTED TO

M. S. RAMAIAH UNIVERSITY OF APPLIED SCIENCES

This is to certify that M. S. Ramaiah University of Applied Sciences has successfully undergone 'Green Audit' on 20th December, 2022 and assessed the Green and Sustainability measures, policies and standards in the campus were found to be excellent.

This certificate is valid till 20th December, 2023

Ref. No: GA / GREEN AUDIT / 01 / 12 / 22

DR NISCHAY N GOWDA
Founder & Director - Green Aura
CERTIFIED ISO EMS-LA, IGBC - AP,
US GREEN BUILDING COUNCIL - GREEN ASSOCIATE
GLOBAL DOCTORATE, SWITZERLAND.

Acknowledgement

The Green Audit Assessment team extends sincere gratitude to the management of M. S. Ramaiah University of Applied Sciences for entrusting us with the crucial task of conducting the Green Audit. We deeply appreciate the cooperation and unwavering support received throughout the completion of this study.

Special thanks are due to the following individuals, whose invaluable contributions played a pivotal role in the success of this audit:

Dr. G. S. Venkatesh, Registrar: Your guidance and support were instrumental in the success of this audit. Your leadership played a crucial role in ensuring the effectiveness of the audit process.

Dr. Nayana Patil, HoD Civil Engineering; **Mr. Parmeshwar.S, Head IQAC**; **Mr. Prakash, Manager Facilities**; **Mr. Sathyanarayana, Head Administration**: Your meticulous attention to detail and comprehensive understanding of educational processes have been a cornerstone of our success in this audit. Your dedication greatly contributed to shaping the positive outcomes we achieved.

The study team consisted of senior technical executives from Green Aura, and the audit spanned multiple visits from October to December 2022.

- **Dr. Nischay N Gowda**, Founder & Director Green Aura, Bengaluru. Lead Assessor PQMS Quality Services Pvt Ltd. (IGBC-AP and LEED-Green Associate)
- **Mr. Sachin Kumawat**, Certified Energy Manager (EM-300475/23).
- **Mr. Akash Kumar**, Engineer.

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Green Aura
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Submitted to:
Registrar,
M. S. Ramaiah University of Applied Sciences
University House, Gnanagangothri Campus
New BEL Road, MSR Nagar, Bangalore – 560054

Audited by:
Green Aura,
692F,12th A cross Bel layout,
Bengaluru- 560091.

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Disclaimer

The Green Audit team has prepared this report for M. S. Ramaiah University of Applied Sciences using input data provided by the University's representatives. Our findings are based on both the provided data and the expert judgment of our team members. While we have taken reasonable care in its preparation, the details in this report are compiled in good faith and rely on the available information.

It is important to highlight that the calculations are derived from our best estimates, and we do not make any express or implied representation, warranty, or undertaking. The Audit team does not assume responsibility for any direct or consequential losses that may arise from using the information, statements, or forecasts in this report.

The information and analysis presented in this report are valid as of the date of our visit and the study period at the site. Our work reflects our best efforts and judgments based on the information available at the time of report preparation. Green Aura does not guarantee the accuracy of this information or any conclusions drawn from it. The observations made in this report serve as an indication of the facility's performance based on our assessment and should not be considered a definitive comment on the functioning of the facility. These observations are solely based on the data recorded during our assessment.

Green Aura disclaims any responsibility for the reader's use of or reliance upon this report, as well as for any decisions made based on its contents. Readers are advised that they assume all liabilities incurred by themselves or third parties resulting from their reliance on this report, including the data, information, findings, and opinions contained within it.

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Executive Summary

University and Institutions wield a significant influence on their surroundings, contributing both positively and negatively to the world at large. The progress of a nation often commences within its educational institutions, where ecological considerations play a pivotal role in overall development. The activities undertaken by a University can result in a diverse range of environmental impacts. A clean and healthy environment not only facilitates effective learning but also fosters a conducive atmosphere for education. M. S. Ramaiah University of Applied Sciences places great importance on environmental factors and is actively incorporating eco-friendly concepts into its operations.

M. S. Ramaiah University of Applied Sciences is firmly committed to sustainability and has taken numerous proactive measures to minimize its environmental footprint. However, there are still several areas where significant improvements can be realized. This report aims to showcase the achievements of M. S. Ramaiah University of Applied Sciences while offering recommendations for enhancing its environmental sustainability. The University conducted a **Green Audit** for the year **2022** and remains dedicated to maintaining a sustainable campus environment.

The primary goal of this report is to identify areas for improvement and propose practical, economically viable solutions to optimize energy and water usage on the campus. Just as individual self-reflection is a natural and integral part of a quality education, institutional self-evaluation is equally essential for a quality educational institution. Consequently, it is imperative for the University to assess its own contributions toward a sustainable future.

M. S. Ramaiah University of Applied Sciences has undertaken various initiatives to promote an eco-friendly campus environment, including:

Energy Conservation, Water Conservation, Efforts for Carbon Neutrality, Hazardous and E-waste Management, Health and Well-Being, Plantation.

The University and its constituent institutions actively engage in activities through organizations like the N.S.S. (National Service Scheme) and other initiatives to raise eco-friendly awareness among students. Special programs featuring prominent personalities are organized to educate and train the public, and students are encouraged to participate in eco-friendly endeavors.

In conclusion, M. S. Ramaiah University of Applied Sciences is committed to its mission of sustainability and continuously strives to create a more environmentally responsible campus for the benefit of its students and the wider community.

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Bangalore - 560 054

Table of Contents

Registrar
M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Green Auditing

The term "Green" signifies practices that are environmentally friendly and do not harm the natural environment. This concept can be encapsulated by the acronym "Global Readiness in Ensuring Ecological Neutrality" (GREEN). A "Green Audit" can be defined as the systematic process of identifying, quantifying, recording, reporting, and analyzing elements of ecological diversity, and expressing these findings in financial or social terms.

To effectively implement a Green Audit, it is essential to understand various key aspects, including the objectives, drivers, future potential, benefits, and advantages of such an assessment. The practical application of Green Auditing involves various measures such as energy conservation, the utilization of renewable energy sources, rainwater harvesting, efforts towards achieving carbon neutrality, and extensive plantation initiatives.

The concept of Green Auditing has gained significance in educational institutions and organizations alike, as it serves as a valuable management tool for evaluating and improving environmental standards. By embracing Green Auditing, institutions can contribute to sustainable development and enhance their overall environmental performance. Moreover, the reckless experimentation with nature, often disregarding natural laws and regulations, is a significant driver behind the growing importance of Green Auditing.

M. S. Ramaiah University of Applied Sciences- Campus.

Approach & Methodology

A comprehensive study was conducted to thoroughly examine every aspect of M. S. Ramaiah University of Applied Sciences. This audit encompassed an array of measurements and analyses, with a specific focus on key areas of energy consumption, water usage, resource utilization, waste management, and sustainable practices. The objective was to assess real losses and potential savings, with a broader aim of enhancing the University's environmental performance.

In pursuit of this goal, a straightforward and locally developed monitoring system was devised. This system involves a set of periodic questions that individuals can voluntarily respond to. It is designed to be user-friendly and accessible, emphasizing ease of use for all participants. The ultimate purpose of this auditing report is to inspire the University to set a positive environmental example for the community and to educate its students about sustainability principles.

The primary areas under investigation during the audit were categorized as follows:

1. **Site Selection:** Examining the appropriateness of the University's location.
2. **Built Environment:** Assessing the infrastructure and facilities on campus.
3. **Water Audit:** Analyzing water consumption and management.
4. **Energy Audit:** Evaluating energy consumption and efficiency.
5. **Good Health and Well-Being:** Promoting a healthy living environment.
6. **Waste Management:** Studying waste disposal practices and their impact.
7. **Green Education:** Integrating sustainability into the educational curriculum.
8. **Transportation:** Assessing transportation-related sustainability measures.

Throughout the audit process, there was a continuous dialogue involving University officials, faculty members, and students. This collaborative approach ensured that the suggestions and recommendations put forth were not only meaningful but also practical and feasible for concurrent implementation.

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I. About

M. S. Ramaiah University of Applied Sciences

M. S. Ramaiah University of Applied Sciences (MSRUAS) is a multidisciplinary, innovative, and collaborative Higher Education Institute established as a Private University by an Act of Karnataka State in 2013, with a vision to be student centric, emphasizing on applied research, while maintaining high academic and ethical standards. Initially, the University had Faculties of Engineering and Technology, Art and Design, Management and Commerce, Mathematical and Physical Sciences, Life and Allied Health Sciences, Pharmacy, Dental Sciences and Hospitality Management. The School of Social Sciences and School of Law were added in 2020. M S Ramaiah Medical College, M S Ramaiah Institute of Nursing Education and Research and M S Ramaiah University of Physiotherapy were brought under MSRUAS in 2022. MSRUAS offers Undergraduate, Postgraduate, Vocational and Ph.D. Programmes. The University has a student strength of around 7000+ and 740+ qualified faculty members well trained in pedagogy and constantly striving to impart quality education to address societal challenges. Through adoption of global best practices in curricular, research, co-curricular and extra- curricular activities, MSRUAS ensures all-round development of students. Directorates of Student Affairs, Training and Lifelong Learning, Transferable Skills and Leadership Development, Research, Internal Quality Assurance Cell, Techno-Centre, Entrepreneurship, International Collaborations and Partnership Management, support the academic activities and interaction with Academia, Research Organizations, Industry, and Communities, in India and Abroad. MSRUAS is equipped with modern infrastructure and laboratories including an Advanced Learning Center supporting initiatives in Research, Advanced Design, Simulation, Testing, Clinical Studies, and Health Care.

VISION

RUAS aspires to be the premier university of choice in Asia for student-centric professional education that lays emphasis on applied research while maintaining the highest academic and ethical standards.

MISSION

Our purpose is the creation and dissemination of knowledge. We are committed to creativity, innovation, and excellence in our teaching and research. We inspire critical thinking, personal development and a passion for lifelong learning.

We value integrity, quality, and teamwork in all our endeavors. And we serve the technical, scientific, and economic needs of our society.

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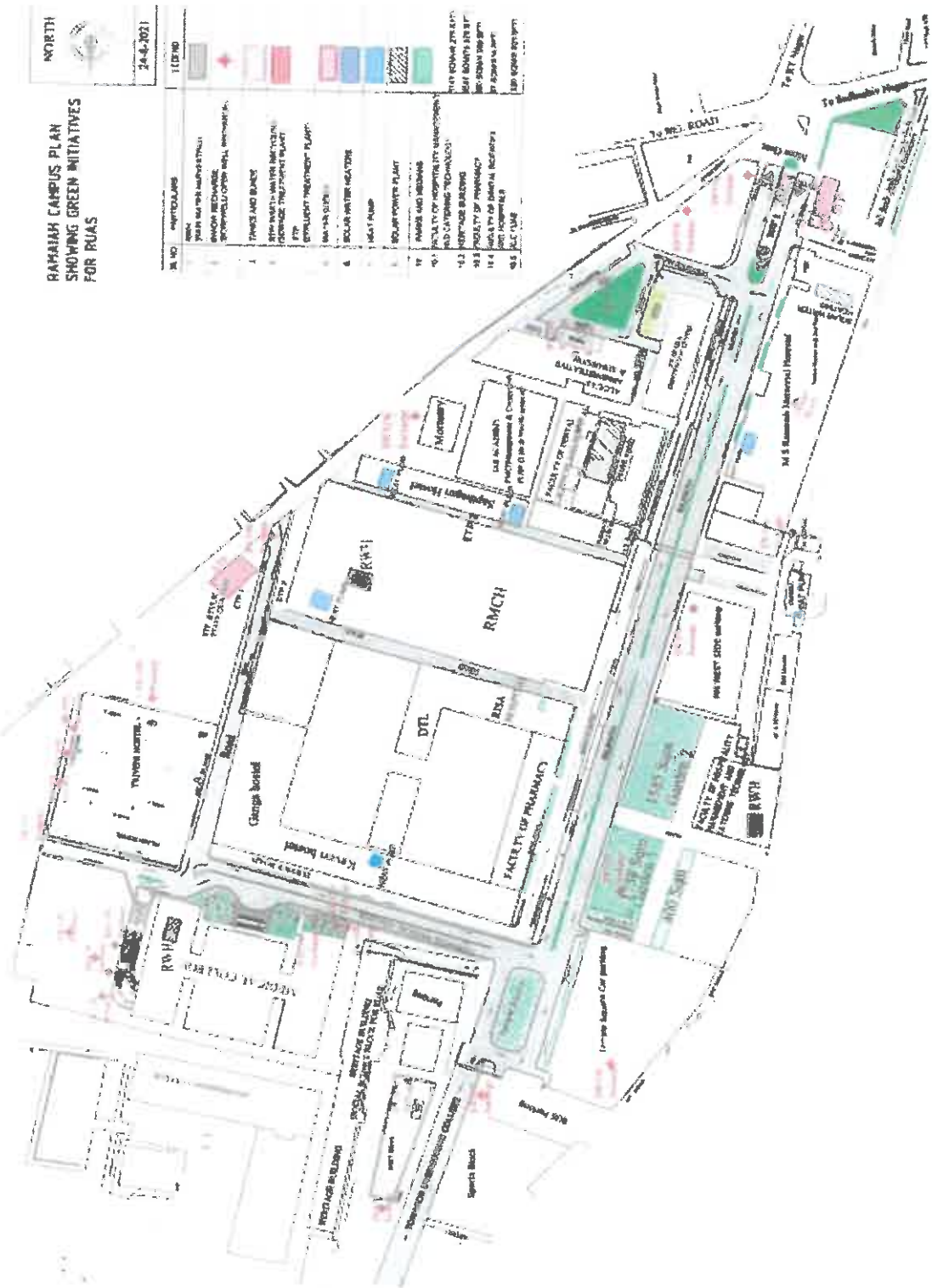
II. Built Environment

i. Layout plan - Gnanagangothri Campus



M. S. Ramaiah University of Applied Sciences Gnanagangothri campus layout plan

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Gnanagangothri Campus: A Nexus of Knowledge and Progress

Nestled in the vibrant locale of Mathikere, the Gnanagangothri Campus stands as a testament to the visionary legacy of its Founder-Chairman, Late Dr M S Ramaiah. Spanning an expansive 31.96 acres, this academic haven is more than just a physical space; it is a convergence point for over 21 healthcare and education initiatives fostered by the esteemed Ramaiah Group.

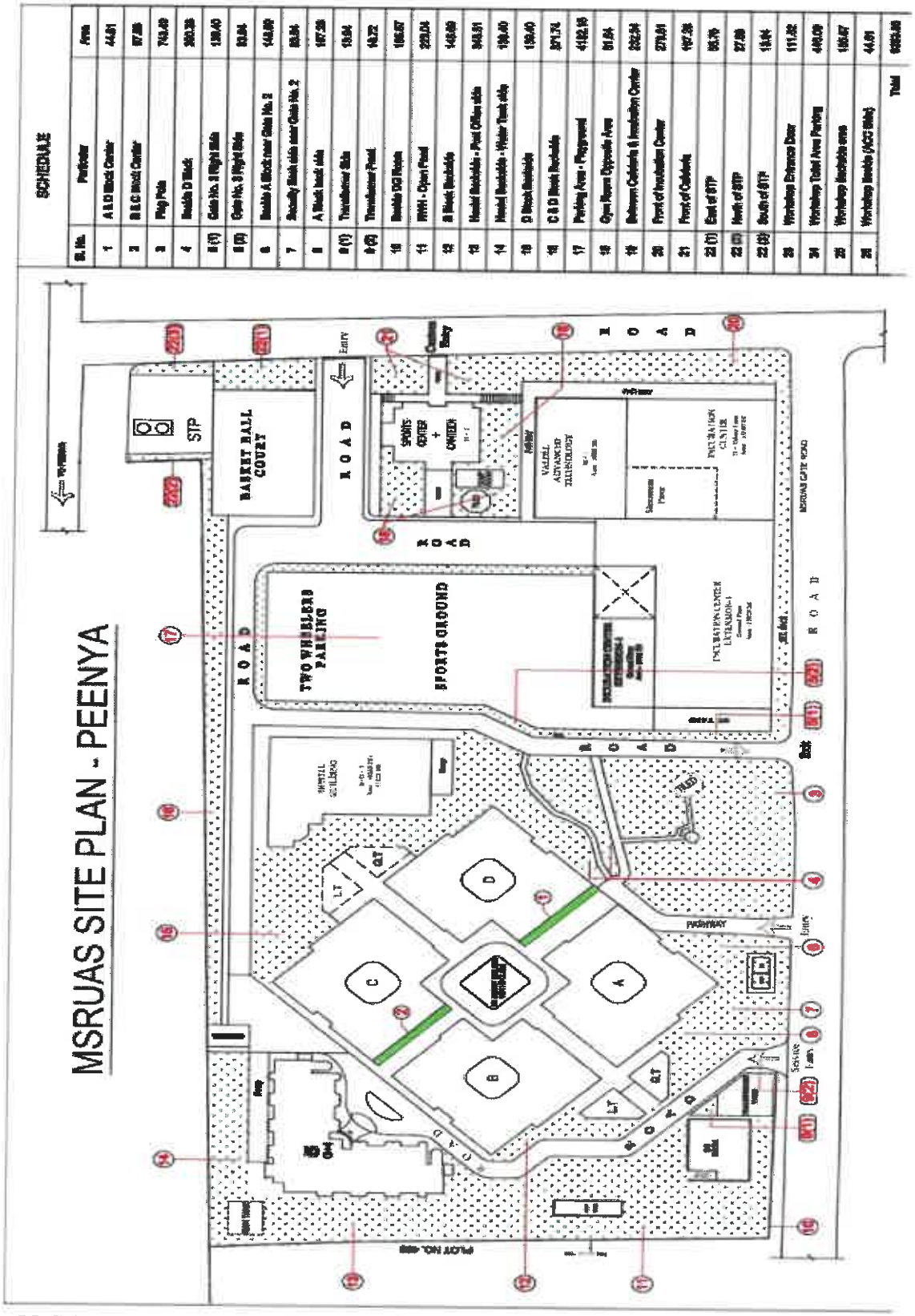
The campus serves as a harmonious coexistence of diverse disciplines, housing the Medical University, Institute of Technology, Institute of Management, University of Law, and the University of Arts, Science & Commerce. In addition, it shares grounds with Memorial Hospital, the Medical University Hospital, and the Indic Specialty Ayurveda Restoration Hospital. This unique integration of various institutions creates an enriching environment where different fields of study, schools of thought, and streams of research seamlessly come together.

Named the 'Well-Spring of Knowledge,' Gnanagangothri was envisioned as a hub propelling academic and societal progress. Founder-Chairman Late Dr M S Ramaiah established this campus with the foresight that it would be at the forefront of enlightenment and contribute significantly to the upliftment of society.

Today, Gnanagangothri is more than a physical space; it is a vibrant community comprising hundreds of students, teachers, researchers, doctors, and healthcare professionals. United in a common pursuit, the campus embodies the spirit of enlightenment, fostering an atmosphere where knowledge transcends boundaries and contributes to the betterment of society. As the Gnanagangothri Campus continues to evolve, it remains a beacon of intellectual vitality and a catalyst for positive societal change.

M. S. Ramaiah University of Applied Sciences Gnanagangothri campus

ii. Layout plan - Ramaiah Technology Campus



M. S. Ramaiah University of Applied Sciences, Ramaiah Technology Campus layout plan

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Ramaiah Technology Campus (Peenya Campus): Where Innovation Meets Industry

Spread across 8.85 acres in the dynamic locale of Peenya, the Ramaiah Technology Campus is a vibrant hub of innovation and learning. Designed over a sprawling 8.86 acres, this campus is strategically situated in close proximity to industries big and small. The short distance from international and local corporations is not just a geographical advantage; it's a strategic asset that the campus leverages through a spectrum of activities including workshops, visits, seminars, and research opportunities.

At this campus, students are afforded a rare and invaluable opportunity to witness, up close, the intricate workings of various industries. This hands-on experience provides them with a distinctive edge over their peers, offering insights that go beyond theoretical knowledge.

Beyond its academic prowess, the Ramaiah Technology Campus in Peenya is committed to eco-friendly measures that significantly reduce its carbon footprint. The campus is not merely a physical space for learning; it's a living, breathing ecosystem that prioritizes sustainability.

Moreover, the campus boasts a range of meticulously planned facilities aimed at ensuring the safety and comfort of every student. It is a testament to the institution's dedication to creating an environment where innovation thrives, and students are equipped not just with academic knowledge but with practical insights that prepare them for the challenges of the real world.

Ramaiah Technology Campus (Peenya Campus) stands as a beacon where innovation meets industry, shaping the future leaders and professionals of tomorrow.

M. S. Ramaiah University of Applied Sciences, Ramaiah Technology Campus

iii. Total built-up area of the University

Gnanagangothri Campus			
Sl. No.	**Name of the Building**	**Floor**	**Area (Sft)**
1	University House	Ground	12675
		First	20057
		Second	17900
2	Faculty of Dental Sciences	Basement	13,850
		Ground	30,374
		First	29,623
		Second	29,623
		Third	29,623
3	Faculty of Management & Commerce and Faculty of Life & Allied Health Sciences	Ground	24,500
		First	22,700
		Second	22,700
		Third	22,700
4	Faculty of Hospitality Management & Catering Technology	Basement	15,300
		Ground	15,300
		First	15,900
		Second	15,900
		Third	15,900
5	Faculty of Pharmacy	Ground	22,700
		First	22,700
		Second	27,000
		Third	24,400
6	Heritage Block (School of Social Sciences and School of Law)	Basement	6,675
		Ground	31,445
		First	28,000
		Second	28,853
		Third	28,000
7	Ramaiah Medical College	Lower Basement	65,250
		Upper Basement	52,780
		Ground	60,270
		First	59,880
		Second	56,590
		Third	58,230
8	Ramaiah Medical College Hospital	Lower Basement 3 and	31,103
		Upper Basement 1	1,17,316
		Ground	1,17,144
		First	1,17,144
		Second	85,459
		Third	24,074
9	Ramaiah Institute of Nursing Education and Research	Ground	12,702
		First	12,702
		Second	12,702
		Third	12,702
10	Triveni Girls Hostel and Nilgiris Boys Hostel	Lower Basement	70,913
		Upper Basement	69,387
		Ground	42,338
		First	42,338
		Second	42,338
		Third	42,338
11	Sapthagiri Hostel	Ground	19,752
		First	19,752
		Second	19,752
12	Faculty Residence – Tulasi Staff Quarters	Stilt Floor	3,200
		Ground + 2 Typical	9,600

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M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Ramaiah Technology Campus			
Sl. No.	**Name of the Building**	**Floor**	**Area (Sft)**
1	A Block (RTC)	Basement	10,600
		First	10,600
		Second	12,100
		Third	12,100
2	B Block (RTC)	Upper	10,600
		Ground	10,600
		First	10,600
		Second	10,600
		Third	10,600
3	C Block (RTC)	Lower	8,600
		Upper	10,200
		Ground	10,200
		First	10,200
		Second	10,200
		Third	10,200
4	D Block (RTC)	Upper	8,600
		Ground	10,200
		First	10,200
		Second	10,200
		Third	10,200
5	Incubation Block (RTC)	Ground	42,200
		First	6,777
6	Workshop Block A (RTC)	Ground, First	19,600
		Second	
7	Workshop Block B (RTC)	Ground and	16,750
		Mezzanine	
8	Ladies Hostel Block (RTC)	Basement	8500
		Ground	8500
		First + Typical	27,450
		Floors	
9	Gents Hostel Block (RTC)	Basement	8,695
		Ground +	33,052
10	Canteen Block (RTC)	Ground	3,714
		First	3,750
11	Service Block (RTC)	Ground	2,800
		First	2,700
12	Toilet Block A & B (RTC)	Ground	1,770
		First	1,770
		Second	1,770
		Third	1,770
13	Toilet Block C & D (RTC)	Ground	1,770
		First	1,770
		Second	1,770
		Third	1,770

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Bangalore - 560 054

iv. Development Footprint and Green Cover

At M. S. Ramaiah University of Applied Sciences, the preservation of site features, particularly greenery within its campus, stands as a cornerstone of its development ethos. Embracing a conscientious approach, the campus prioritizes the retention of natural elements—trees, plants, and green spaces during its construction endeavors. This deliberate strategy serves to curtail site damage and reduce the associated negative environmental impacts. The University is dedicated to achieving a delicate equilibrium between its building footprint and the existing green cover. By meticulously integrating construction with the preservation of vegetation, thecampusensures that the architectural and infrastructural developments seamlessly coexist with the natural landscape. This commitment not only amplifies the overall aesthetic appeal of the campus but also fosters thriving habitats for wildlife, encourages biodiversity, and significantly contributes to the creation of a sustainable, environmentally friendly environment.

M. S. Ramaiah University of Applied Sciences campus development footprint and green cover

A dedicated effort is made to preserve the campus's natural features, aiming to minimize site damage and reduce negative environmental impacts. An integral part of this conservation initiative is the deliberate preservation of existing trees without disruption. This commitment to safeguarding mature trees not only aligns with the institution's environmental sustainability goals but also serves to maintain the ecological integrity of the site.

M. S. Ramaiah University of Applied Sciences campus development footprint and green cover

v. Day lighting

At M. S. Ramaiah University of Applied Sciences, the integration of abundant natural daylight through passive architectural methods stands as a hallmark of its design philosophy. Across various spaces, including classrooms, laboratories, computer labs, and the library, thecampusshowcases a deliberate and thoughtful approach to maximize the use of natural light. Through strategic placement and expansive windows, each area is meticulously designed to invite in copious amounts of daylight, creating bright, inviting, and conducive spaces for learning, research, and study. This conscious use of daylight not only enhances the aesthetic appeal of the campus but also fosters an environment that supports the well-being, focus, and productivity of students and faculty across different educational and research settings.

Feeling of space and light in the building

vi. Heat Island Reduction, Non-roof and roof

Urban heat islands occur when cities replace natural land cover with dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat. This effect increases energy costs (e.g., for air conditioning), air pollution levels, and heat-related illness and mortality.
The university has taken proactive steps to combat the urban heat island effect and minimize its impact on microclimates, as well as the well-being of both humans and wildlife. They have achieved this by strategically planting native, drought-tolerant shade trees and smaller vegetation like shrubs, grasses, and groundcover across the campus. This comprehensive landscaping approach prioritizes tree cover on exposed non-roof impervious areas, effectively reducing heat absorption and promoting a more comfortable environment. Moreover, the provision of shade for over 100% of the parking spaces through covered structures demonstrates a commitment to mitigating heat-related issues and underscores the University's dedication to sustainable and eco-friendly practices.

Native grass for lawn and drought tolerant shade trees at University to reduce heat island effect

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Bangalore - 560 054

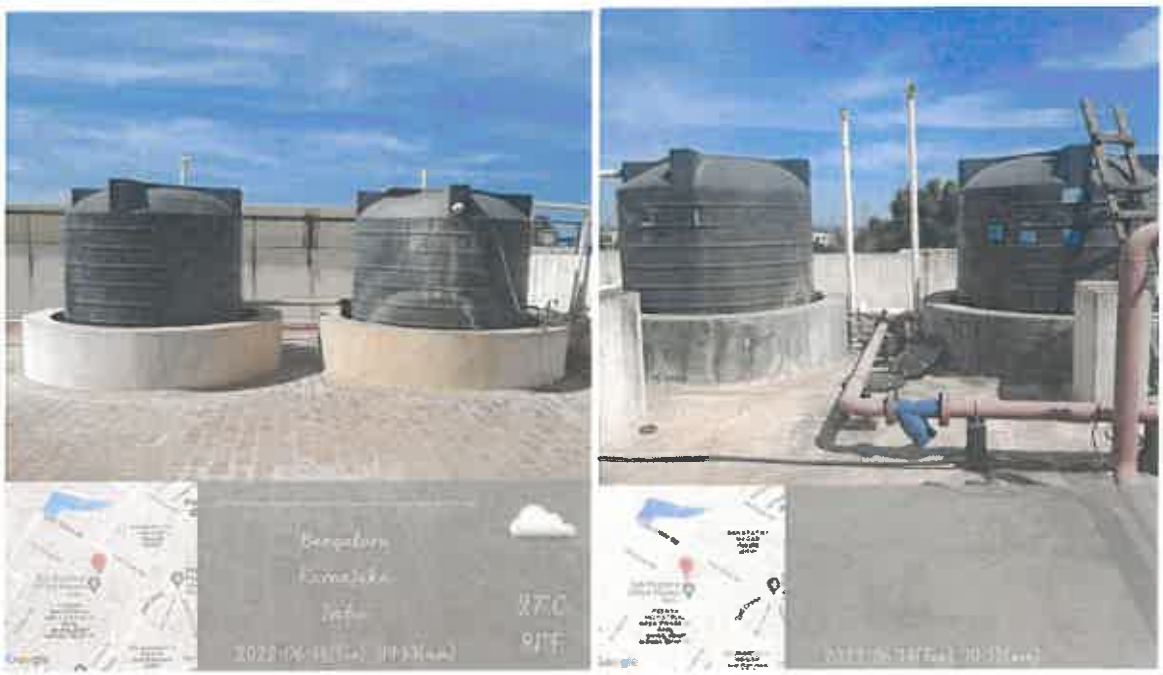
III. Water Audit

A water audit serves as an effective management tool for minimizing losses, optimizing various uses, and facilitating significant water conservation. The campus's commitment to efficient water usage and management is evident through various activities, ensuring satisfaction and the absence of unnecessary water wastage.

Throughout the survey, no instances of water wastage were observed. The open grounds, adorned with ample greenery, serve as a means for water percolation, eliminating barren areas. The campus features a functional rainwater harvesting unit, utilizing collected water for various campus needs. Furthermore, all wastewater from the campus undergoes treatment in a fully operational Sewage Treatment Plant, and the treated water is reused for gardening purposes within the university. This comprehensive approach underscores the campus's dedication to responsible water management and sustainability.

i. Water Supply and Usage

The university meets its water needs primarily through strategically located bore wells, with a total of six on campus. These bore wells serve as essential reservoirs, ensuring a consistent water supply throughout the year. To enhance groundwater sustainability, the university has implemented recharge structures for all bore wells. These structures allow rainwater and surface runoff to percolate into the ground, contributing to the preservation of groundwater resources. This approach reflects the university's commitment to efficient water management and resource conservation.



Summary of water resources at RTC, Peenya

S no	Details	Numbers	Source	Location	Capacity	Utilization
1	Source of Water	2	Bore-well	Gate no.2 and Gate no.5	2.5 inch and 3 inch	Laboratories, toilets and Mess kitchen
2	Facilities of raw water intake: Pumps	2	Suguna make	Gate no.2 and Gate no.5	5 HP each	Pumping of water to overhead tank
3	Water treatment and reuse	1	Used water	Near Gate no 5	5000 KLD	Treated water will be reused for flushing of toilets and gardening
4	Water conservation and methods	1	Rain water harvesting	Behind the hostel building	1 lakh liter	To improvethe water resources

ii. Water consumption

As a primary data collected by survey, we found

Sr. No.	Particulars	Details
1	Students staying at Hostel	250
2	Students at University	2267
3	Teaching Staff	437
4	Non-Teaching Staff	318
5	Visitors	200
	Total	3472

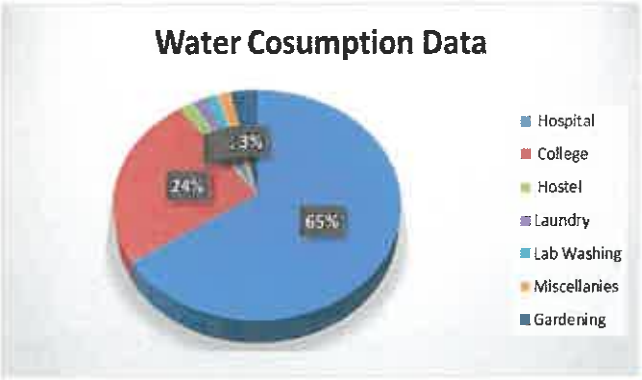
Estimation of water requirement for drinking & domestic use as per (Source: NBC 2016, BIS)

Sr. No.	Particulars	Details	Water Consume limit	Total water in lit/day
1	Students staying at Hostel	250	135 lit/day	11250
2	Students at University	2267	45 lit/day	102015
3	Teaching Staff	437	45 lit/day	19665
4	Non-Teaching Staff	318	45 lit/day	14310
5	Visitors	200	15 lit/day	3000
	Total	3472		150240

Total expected Water consumption as per NBC 2016, BIS for MSRUAS is 150.24 m^3/day.

Actual Water Uses for both Campus:

Sr.No.	Description	Water Consumption (m^3/day)	Source/Remark
1	Domestic		1.BWSSB 2.Ground Water
	a) Hospital	400	
	b) University	150	
	c) Hostel	10.7	
2	Laundry	20	
3	Lab Washing	10	
4	Miscellanies	10	Fresh Water
	Total	600	
5	Gardening	20	Treated/Recycle Water from STP Plant
6	Flushing	100	
		720	(Fresh Water & Treated Water From STP)



iii. Water quality

The quality of the bore well water has been assessed and meets the standards for potable (drinkable) water. To ensure the continued safety and quality of the drinking water provided to staff and students, thecampushas implemented a comprehensive water treatment system. This system includes UV (Ultraviolet) and RO (Reverse Osmosis) filtration systems installed on each floor of every block. These filtration systems effectively purify the water, making it safe for consumption, and contribute to the overall well-being of the University community by providing access to clean and potable drinking water.

Drinking water facility in each block

Water Test Reports

SLN TESTING LABORATORY

Recognized by : MOEF & CC and An ISO 9001 : 2015
and OHSAS Certified Laboratory
15, Premnagar, Pipeline Road, Laggere, Bangalore - 560 058.
Mob. : 9844086162, 9538888098, E-mail : slntestinglaboratory@gmail.com, Web : www.slnlabs.com

TEST REPORT

Page No. 1 of 1

Report No : SLNTL2200704358	Report Date : 19/07/2022
Issued To: M/s. MS Ramaiah applied science Peenya Bangalore.	Customer Reference : Verbal
	Date of Receipt : 15/07/2022
	Date of test start : 15/07/2022
	Date of Completion of test : 19/07/2022
Sample Received By: Customer	Sample Particulars : Borewell Water-2

Parameters	Results	Maximum Acceptable Limits (in mg/L) (As per IS 10500:2012)	Maximum Permissible Limits (in mg/L)	Test Method
Colour, Hazen Units	18	5	15	IS:3025 Part-4
Odour	Agreeable	Agreeable	Agreeable	IS:3025/Part-5
Turbidity, NTU	2.6	1	5	IS:3025/Part-10
pH Value	7.15	6.5 – 8.5	No Relaxation	IS:3025/Part-11
Total Hardness as $CaCO_3$, mg/L	495.3	200	600	IS:3025/Part-21
Calcium as Ca, mg/L	121.4	75	200	IS:3025 Part-40
Magnesium as Mg, mg/L	46.6	30	100	IS:3025/Part-46
Chloride as Cl, mg/L	328.9	250	1000	IS:3025/Part-32
Total Dissolved Solids, mg/L	968.0	500	2000	IS:3025/Part-16
Sulphate as SO_4, mg/L	32.4	200	400	IS:3025 Part-24
Nitrate as NO_3, mg/L	4.9	45	No Relaxation	IS:3025/Part-34
Fluoride as F, mg/L	0.4	1.0	1.5	IS:3025/Part-60
Iron as Fe, mg/L	0.1	0.3	No Relaxation	IS:3025 Part-53
Chromium as Cr^{6+}, mg/L	<0.01	0.05	No Relaxation	IS:3025/Part-52
Zinc as Zn, mg/L	<0.5	5	15	IS:3025/Part-49
Copper as Cu, mg/L	<0.01	0.05	1.5	IS:3025/Part-42
Manganese as Mn, mg/L	<0.1	0.1	0.3	IS:3025/Part-59
Aluminium as Al, mg/L	<0.01	0.03	0.2	IS:3025/Part-55
Boron as B, mg/L	<0.1	0.5	1	IS:3025/Part-57
Total Alkalinity as $CaCO_3$, mg/L	350.0	200	600	IS:3025/Part-23
Total Coli form, MPN/100ml	<1	Not Detectable		IS 1622-1981
E. Coli, MPN/100ml	<1	Not Detectable		IS 1622-1981

Remarks: The given water sample does not meets to limits as per IS 10500:2012 for above physical, chemical and microbiological testing.

******End of the Report******

Authorised Signatory

Note : 1. The results listed pertain only to the tested samples and applicable parameters.
2. Samples will be destroyed after 15 days from the date of issue of test certificates unless & otherwise specified and

SLN TESTING LABORATORY

Recognized by : MOEF & CC and An ISO 9001 : 2015
and OHSAS Certified Laboratory
15, Premnagar, Pipeline Road, Laggere, Bangalore - 560 058.
Mob. : 9844086162, 9538888098, E-mail : slntestinglaboratory@gmail.com, Web : www.slnlabs.com

TEST REPORT

Page No. 1 of 1

Report No : SLNTL2200704359A	Report Date : 19/07/2022
Issued To: M/s. MS Ramaiah applied science Peenya Bangalore	Customer Reference : Verbal
	Date of Receipt : 15/07/2022
	Date of test start : 15/07/2022
	Date of Completion of test : 19/07/2022
Sample Received By: Customer	Sample Particulars : Borewell Water-1

Parameters	Results	Maximum Acceptable Limits (in mg/L) (As per IS 10500:2012)	Maximum Permissible Limits (in mg/L)	Test Method
Colour, Hazen Units	<5	5	15	IS:3025/Part-4
Odour	Agreeable	Agreeable	Agreeable	IS:3025/Part-5
Turbidity, NTU	<1	1	5	IS:3025/Part-10
pH Value	7.10	6.5 – 8.5	No Relaxation	IS:3025/Part-11
Total Hardness as $CaCO_3$, mg/L	525.6	200	600	IS:3025/Part-21
Calcium as Ca, mg/L	161.8	75	200	IS:3025/Part-40
Magnesium as Mg, mg/L	29.4	30	100	IS:3025/Part-46
Chloride as Cl, mg/L	349.5	250	1000	IS:3025/Part-32
Total Dissolved Solids, mg/L	1012.0	500	2000	IS:3025/Part-16
Sulphate as SO_4, mg/L	34.9	200	400	IS:3025/Part-24
Nitrate as NO_3, mg/L	5.4	45	No Relaxation	IS:3025/Part-34
Fluoride as F, mg/L	0.4	1.0	1.5	IS:3025/Part-60
Iron as Fe, mg/L	0.1	0.3	No Relaxation	IS:3025/Part-53
Chromium as Cr^{6+}, mg/L	<0.01	0.05	No Relaxation	IS:3025/Part-52
Zinc as Zn, mg/L	<0.5	5	15	IS:3025/Part-49
Copper as Cu, mg/L	<0.01	0.05	1.5	IS:3025/Part-42
Manganese as Mn, mg/L	<0.1	0.1	0.3	IS:3025/Part-59
Aluminium as Al, mg/L	<0.01	0.03	0.2	IS:3025/Part-55
Boron as B, mg/L	<0.1	0.5	1	IS:3025/Part-57
Total Alkalinity as $CaCO_3$, mg/L	380.0	200	600	IS:3025/Part-23
Total Coli form, MPN/100ml	Not detected	Not Detectable		IS 1622-1981
E. Coli, MPN/100ml	Not detected	Not Detectable		IS 1622-1981

Remarks: The given water sample meets to maximum permissible limits as per IS 10500:2012 for above physical, chemical and microbiological testing.

******End of the Report******

Authorised Signatory

Note : 1. The results listed pertain only to the tested samples and applicable parameters.
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iv. Rain water harvesting

At MSRUAS, a comprehensive strategy for rainwater harvesting has been embraced, promoting sustainable water management practices on campus. Employing the non-roof method, the campus has implemented an innovative approach to optimize rainwater utilization and effectively recharge the groundwater table. Specific structures, including recharge pits, have been strategically placed across the campus to capture and infiltrate rainwater into the ground. This approach not only conserves water but also significantly contributes to enhancing the groundwater table.

Additionally, the campus has integrated an advanced system of drain channels intelligently distributed throughout the campus. These channels are designed to collect rainwater and channel it to a centralized point or low-lying areas. This meticulous planning ensures that rainwater is efficiently gathered and redirected to specific zones for effective absorption or collection. By adopting this holistic approach, the campus minimizes surface runoff and effectively manages rainwater, contributing to both groundwater replenishment and the conservation of water resources.

Highlighting green initatives in GG Campus

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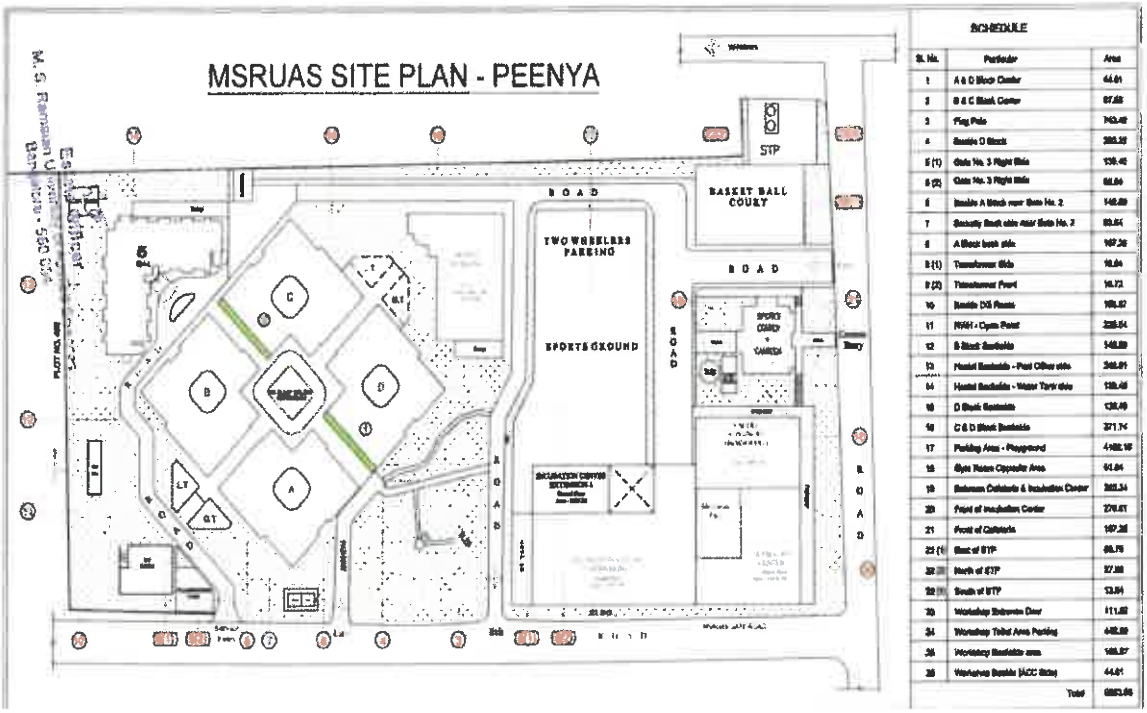

Highlighting green initatives in RT Campus

Rain water Recharge Pit

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IV. Good Health and Well-being.

i. Campus design caters to differently able people

The campus design places a strong emphasis on accessibility and inclusivity, catering to differently-abled individuals and senior citizens. Several measures have been implemented to ensure their comfort and ease of movement, including:

Non-Slippery Ramps: Ramps with non-slip surfaces have been installed to provide smooth access for individuals with mobility challenges, ensuring safe and secure movement.

Non slippery ramps

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Wheel chair and stretcher facilty

Lifts with Braile assistance

Wheelchairs: Wheelchairs are provided to assist those who require mobility aids, facilitating their movement within the campus.

Preferred Parking for Differently-Abled: Designated parking spaces have been allocated for differently-abled individuals, allowing them convenient access to the campus facilities.

Preferred Parking for Differently-Abled

Washroom facilty for differently abled

These measures collectively create an inclusive environment, promoting equal access and participation for all members of the campus community, regardless of physical abilities or age.

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ii. Fire suppression system

To ensure the safety and well-being of the University community, University has implemented a robust fire safety system with hand held fire extinguishers and are Halon free.campushas not used any Halon based fire suppression system. Carbon dioxide B C Fire Extinguisher, also including dedicated fire safety water lines. These water lines serve as a crucial component of our emergency response plan, providing the means to combat fires effectively and minimize potential damage.

Fire suppression system

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V. Waste Management Audit.

M. S. Ramaiah University of Applied Sciences is committed to promoting environmentally responsible practices, and one key area where this commitment is evident is in its waste management strategies. By implementing a range of initiatives, the university aims to reduce its environmental impact, minimize landfill contributions, and foster a culture of sustainability among its students and staff.

Source Segregation:
The university has established a robust source segregation system, encouraging the separation of waste at its origin. Dust bins for biodegradable and plastic waste are strategically placed across the campus, facilitating the easy disposal of waste materials by students and staff.

Regular Cleaning and Municipal Service Collaboration:
Daily cleaning activities ensure the maintenance of a clean and hygienic environment.
A significant portion of non-biodegradable waste is efficiently lifted by the City Municipal service, reinforcing the university's commitment to responsible waste disposal.

Specialized Handling of Hazardous Waste:
University is responsible for the collection and proper disposal of various types of hazardous waste generated within the university, ensuring adherence to safety and environmental standards.

Hazardous waste room at GG campus

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E-waste Management:

The university recognizes the importance of responsible e-waste management. Defective items from the computer lab and other electronic waste are stored appropriately.

An approved e-waste management and disposal facility have been contacted to ensure the scientific and environmentally sound disposal of electronic waste, with a focus on potential reuse.

Dedicated Collection Centers:

Specific collection centers on campus are designated for all kinds of waste generated, ensuring safe and compliant handling of these materials.

General waste room

Bio medical waste room

Biomedical waste segregation and storage area at GG Campus

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Promotion of 3R Principles:

Reduce:

M. S. Ramaiah University of Applied Sciences has taken significant steps to reduce paper usage. Paperless processes have been implemented for admissions, examination forms, and financial transactions. Students are encouraged to use both sides of paper for writing tests, and the adoption of paper binding for academic practical records has replaced the use of plastic. The dissemination of notices and circulars to faculty is predominantly done through email, minimizing the need for printed materials.

Reuse:

The university adopts a proactive approach to e-waste and defective items from the computer lab, storing them with the aim of facilitating reuse whenever feasible. Through fostering a culture of material reuse, M. S. Ramaiah University of Applied Sciences plays an active role in reducing waste generation.

Sewage Treatment Plant: The university has implemented a sewage treatment plant designed to treat wastewater to tertiary standards, preventing water stream pollution. This advanced technology employs the MBBR wastewater treatment plant, with capacities of 50+150 KLD at the RT Campus and 250 KLD at the GG campus. This initiative underscores our commitment to responsible water management and environmental preservation.

STP 50 & 150 Tank at RT Campus

250 KLD STP at GG Campus

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Bio Gas plant: The university is on the brink of a significant leap towards environmental sustainability with the planned installation of a biogas plant. This visionary initiative underscores our commitment to responsible waste management and resource reuse. Through the conversion of organic waste into renewable biogas via anaerobic digestion, we not only address waste-related concerns but also contribute to a cleaner and more sustainable campus. The project's success hinges on a comprehensive waste collection and segregation system, complemented by active engagement from the university community through educational programs. This undertaking seamlessly aligns with our commitment to reducing our carbon footprint and exemplifies our university's proactive stance in shaping a greener future. The 200-litre capacity biogas digester installed behind the Vivekananda Girls Hostel efficiently produces gas used for heating applications in the hostel mess.

Biogas plant at RT campus

Recycle: Waste management is systematically organized with the installation of designated dustbins. Source segregation is implemented through the provision of separate bins for biodegradable and plastic waste. Adequate information is disseminated among students and staff members, guiding them on the effective management of waste generated within the campus. This structured approach ensures a conscientious and informed community engaged in responsible waste disposal practices.

Pad buring machine : The university is taking a pivotal stride towards sustainable waste management by introducing a pad-burning machine. In harmony with our dedication to environmental responsibility, this initiative offers an eco-friendly solution for the disposal of sanitary products. Through the strategic placement of these machines across the campus and their seamless integration into the existing waste management infrastructure, our objective is to effectively incinerate used pads, thereby mitigating the environmental impact typically associated with traditional disposal methods. The incorporation of pad-burning machines not only aligns with our waste reduction objectives but also contributes to fostering a cleaner and more sustainable campus environment. This underscores our steadfast commitment to responsible waste management practices.

PAD Buring machine

Conclusion:

M. S. Ramaiah University of Applied Sciences has effectively instituted a robust waste management strategy that adheres to the tenets of sustainability. By implementing source segregation, partnering with municipal services, and meticulously managing diverse waste streams, the university stands as a commendable model for responsible waste management in academic settings. The institution's adherence to the 3R principles—Reduce, Reuse, and Recycle—reflects its unwavering commitment to diminish its environmental impact and cultivate a culture of sustainability among students, staff, and the wider community.

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VI. Observation and Recommendation

Observations of the Green Audit

Our recent Green Audit has yielded several noteworthy observations that reflect commitment to sustainability and environmental responsibility. These observations encompass various aspects of our operations and practices across:

1. Well-Preserved Signages: We are delighted to report the meticulous maintenance of signages, crucial for guiding and informing our campus community, at all relevant locations across our campuses.

2. Paper Consumption Oversight: Diligent monitoring of paper consumption is implemented across all our buildings, showcasing our dedication to minimizing paper waste and fostering eco-friendly practices.

3. Efficient Waste Management: Waste bins and containers are strategically positioned, featuring separate receptacles for different types of waste. Continuous monitoring of waste quantities ensures effective waste management.

4. Responsible E-Waste Disposal: E-waste is responsibly handled by returning it to suppliers for proper disposal, mitigating its environmental impact.

5. Lead-Acid Battery Management: Used lead-acid batteries are returned to manufacturers or their agents during replacements, ensuring safe and environmentally conscious disposal.

6. Afforestation Initiatives: Our commitment to environmental conservation is demonstrated through the planting of over 100 saplings in and around our campus as part of NSS and other initiatives.

7. Environmentally Friendly Cleaning Practices: We prioritize the use of eco-friendly cleaning agents to maintain the cleanliness of our floors and toilets across all campuses.

8. Fire Safety Protocols: Fire extinguishers undergo regular refilling, and mock drills are conducted to prepare our campus community for potential fire emergencies.

9. Accessible First Aid: First aid kits are conveniently available on each floor of the campus, with regular monitoring to ensure consistent accessibility of all items.

These observations reaffirm University dedication to environmental sustainability and our resolve to create a greener, safer, and more eco-conscious environment campuses.

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Recommendations for Sustainable Practices

Following the recent Green Audit, we have identified several key recommendations aimed at further enhancing our sustainability efforts and environmental responsibility:

1. Water Meter Installation: Implement the installation of water meters at all water tank outlets to precisely monitor and regulate water usage across the campus.

2. Creation of a Butterfly Habitat: Establish a butterfly garden on campus to celebrate and acknowledge the diversity of flora and fauna, promoting the conservation of biodiversity.

3. Environmentally Conscious Procurement Policy: Enact and enforce an Environmentally Responsible Purchasing Policy to serve as a guiding framework for our procurement decisions, with the objective of diminishing our environmental impact.

4. Stakeholder Collaboration: Promote engagement from governmental bodies, foundations, and industry partners in interdisciplinary research, education, policy development, and the exchange of information pertaining to environmentally sustainable development.

5. Employee Green Space Stewardship: Consider assigning tree ownership to our employees, fostering a sense of belonging and responsibility for maintaining the green spaces on campus.

6. Canteen Upgrade for Renewable Energy: Explore the enhancement of our canteen's cooking system by incorporating solar water heaters with heat pumps. This initiative aims to curtail gas consumption and champion the use of renewable energy sources.

7. Sustainability Training Programs: Introduce comprehensive sustainability training initiatives aimed at educating our University community about sustainable practices and fostering a sense of environmental stewardship.

8. Installation of Automatic Faucets: Incorporate auto-flush systems for basins to reduce water consumption and encourage efficient handwashing practices during renovations or new construction projects.

9. Utilization of Low VOC Paints: When undertaking renovations, maintenance, or constructing new buildings, prioritize the use of low VOC paints for painting purposes to minimize environmental impact.

10. Prompt Address of Leaks: Take immediate action to rectify leaks by repairing taps and pipes promptly, aiming to minimize water wastage.

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