

GREEN AUDIT REPORT

2019-2020



VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY

ODISHA, BURLA-768018

INDIA



Vice-Chancellor

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From the Desk of Chairperson, IQAC

Veer Surendra Sai University of Technology, Burla, Odisha is conducting the green auditing in 2019-2020 for a sustainable future of the campus. This audit process involved initial interviews with management to clarify policies, activities, records and the co-operation of staff and students in the implementation of mitigation measures. This was followed by staff and student interviews, collection of data through questionnaire, review of records, observation of practices and observable outcomes. Besides, the approach ensured that the management and staff are active participants in the green auditing process at the University. The findings of this report show that the University performs fairly well on sustainability issues and has made possible rectifications on the previous audit recommendations within a year. The University does consider the environmental impacts of most of its actions and makes a concerted effort to act in an environmentally responsible manner. Even though the University does perform fairly well, the recommendations in this report highlight many ways in which the University can work to improve its actions and become a more sustainable University.



Summary

Rapid industrialization and urbanization have created several environmental issues which may lead to the ecological crisis. Keeping this in mind it becomes essential to adopt sustainable methods in our day to day activities. VSSUT Burla believes in the same and is striving to address issues related to environmental problems.

The purpose of the green audit is to see that the practices followed in the campus comply with the green policy adopted by the institution. The methodology includes preparation and filling up the questionnaire, physical inspection of the campus, observation and review of the documentation, data analysis, measurements and recommendations. It works on several facets like Water conservation, Tree plantation, and Waste management, use of Alternative energy source etc. The objective of the audit is to evaluate as to which degree the University comply with the same.



1. About the University

The Veer Surendra Sai University of Technology (VSSUT) Odisha was formed vide Orissa Act 9 of 2009 by converting University College of Engineering (UCE), Burla to a non-affiliating unitary University and came into force vide notification of the Industries Department, Government of Odisha in 1st July 2009 (Vide memo No.IV/TTI-33/2009-8553 and 8564 dtd.10th June 2009). The statutes of VSSUT, Burla 2010 has been approved by the Odisha Government vide Industry Department notification No.V-FE-II-01/2010/8697 dated 21st June 2010. This state government University is also recognized by University Grants Commission (UGC), New Delhi vide UGC letter No. F.9-36/2009(CPP-I) dated 5th Jan 2010. The University is empowered to award degrees as specified by the UGC under section 22 of the UGC Act. The University has been declared eligible to receive central assistance under Section 12B of the UGC Act vide letter F.No.9-36/2009(CPP-I/PU) dated 8th November 2012.

1.1. Vision of the University

To emerge as an internationally acclaimed technical University to impart futuristic technical education and creation of vibrant research enterprise to create quality engineers and researchers, truly world-class leader and unleashes technological innovations to serve the global society and improve the quality of life.

1.2. Mission of the University

The Veer Surendra Sai University of Technology, Odisha, Burla strives to create values and ethics in its products by inculcating depth and intensity in its education standards and need-based research through

- Participative learning in a cross-cultural environment that promotes the learning beyond the classroom.
- Collaborative partnership with industries and academia within and outside the country in learning and research.



- Encouraging innovative research and consultancy through the active participation and involvement of all faculty members.
- Facilitating technology transfer, innovation and economic development to flow as natural results of research where ever appropriate.
- Expanding curricula to cater broader perspectives.
- Creation of service opportunities for upliftment of the society at large.

1.3. University Administration

Chancellor	: His Excellency Prof. Ganeshi Lal, Governor of Odisha
Vice-Chancellor	: Prof. Atal Chaudhuri
Registrar	: Smt. Upama Kalo, OAS (S)
Comptroller of Finance	: Shri. Nilam Prakash Kujur, OFS
Director, IQAC	: Prof. Bibhuti Bhusan Pati
PIC Civil Maintenance	: Prof. Sanjaya Kumar Patro
Maintenance Engineer	: Er. Akash Naik

1.4. Members of the Board of Management

- Prof. Atal Chaudhuri, Vice-Chancellor, VSSUT, Burla (Ex-officio)
- Sri Sanjay Kumar Singh, IAS, Commissioner cum Secretary, SD & TE Dept., Govt. of Odisha, Bhubaneswar (Ex-officio)
- Principal Secretary to Government, Finance Department, Government of Odisha. (Ex-officio)
- Director of Technical Education & Training, Odisha (Ex-officio)
- Hon'ble Vice-Chancellor, Biju Pattnaik University of Technology, Odisha, Rourkela



- Prof. Kusum Sudhakar Reddy, Professor, Civil Engineering, IIT, Kharagpur
- Prof. Venkappayya R Desai, Professor, Civil Engineering, IIT, Kharagpur
- Prof. H.C.S. Rathore, Vice-Chancellor, Central University of South Bihar, Patna, Bihar, UGC Nominee
- Er. Bimal Krushna Mishra, Ex-CEO, RSB Metal Tech.(P) Ltd., N2/40, IRC Village, Bhubaneswar (Alumni)
- Er. Sashi Sekhar Mohanty, CMD, Neelachal Ispat Nigam, Jajpur, Odisha. (Alumni)
- Prof. Amar Nath Nayak, Professor in Civil Engineering VSSUT, Burla
- Prof. Prakash Chandra Swain, Professor in Civil Engineering VSSUT, Burla
- Dr. Rakesh Mohanty, Associate Professor, VSS University of Technology
- Shri Kishore Kumar Mohanty, M.L.A., Jharsuguda
- Shri Debesh Acharya, M.L.A., Bargarh
- Registrar, VSSUT, Burla, Convener-cum-Secretary

2. Overview of the University:

Veer Surendra Sai University of Technology (VSSUT), Burla was established in the year 1956 as UCE, Burla - the first engineering college of the state. The University occupies over 502 acres of prime land in Burla at the foothill of world famous Hirakud dam. It is located at Burla only 10 Km away from the city center of Sambalpur Municipality, and well connected to rest of India through national highway, railway and airway. The University is surrounded by other reputed educational institutes like Sambalpur University, VSS Medical college, IIM Sambalpur, GM University, Odisha State Open University. Apart from this, a large number of public and private sector industries such as MCL, OHPC, HINDALCO, NALCO, NTPC, OPTCL, Vedanta Aluminium Ltd and Bhusan Steel Plant operate in its vicinity.

Over the years, the VSSUT, Burla has carved a niche for itself among the best technical institutes in India, and a dream institute for many budding engineers. The University offers B.Tech., M.Tech., M.Sc., MCA and Doctoral research programmes. True to its reputation, the University has produced over 25,000 graduate engineers, and 5000 post graduate engineers including doctorates. The University has a strong alumni base and most of them have occupied coveted positions in many public offices in India, and educational, industrial and research organizations all over the world.



The University is fully residential with modern amenities and resources. It houses the administrative block cum academic building, auditorium, library, central internet facility, central computing facility, central workshop, e-learning center, innovation cum incubation center, gymkhana, eleven halls of residence for student accommodation, guesthouse and quarters to accommodate the faculty members, officers and staff of this University. Apart from these facilities like dispensary, bank, post office, park, playground, canteen, cafeteria, etc. are available for its residents. New state-of-art computer center, gymkhana, and swimming pool are under construction.

The University follows the philosophy of “learning in the lap of nature”. In tune with the above philosophy, more than 60% of the campus is kept green. The University has lush-green landscaped campus with varieties of flowering plants and perennial tree species. The University emphasizes Reduce, Reuse and Recycle of waste to reduce the environment footprint, and to preserve natural resource. The University encourages its students and staffs to adopt a sustainable framework to reduce the carbon footprints.

2.1. Key infra structures:

Sl. No.	Description	Details	Area/Plinth Area
Land In Use			
1	University		36.5 Acres
2	Hall of Residences		28.0 Acres
3	Staff Quarters		69.1 Acres
4	Free Land		266.77 Acres
5	Govt. Land Available for Extension		102.00 Acres
Construction details			
1	University Building	Main building of plinth area	1,22,715 sft
2		Workshop plinth area	27858 sft
3		Workshop office	3100 sft
4		High voltage Laboratory	1200 sft



5		Cycle shed	4600 sft
6		Garage	1660 sft
7		Guest House	3120 sft
8		Robotic Club	2700 sft
9		Auditorium	14850 sft
10		N.C.C. Building	6000 sft
11		Gymnasium	3300 sft
12		Athletic Building	1730 sft
13		Maintenance office	3200 sft
14		Dispensary	2560 sft
15		Computer Science & Engg. Building	19010 sft
16		Workshop Extension	2610 sft
17		Hydraulics Laboratory extension	1140 sft
18		Cycle sheds	2120 sft
19		Library Building	14050 sft
20		Administrative Building	8530 sft
21		Extension of Electrical & ELTCE Building	2880 sft
22		Innovation and Incubation centre	15629 sft
23		Community centre	2700 sft
		Total	267262 sft.
23	Halls of Residence	Atri Hall (Boys)	47260 sft
24		Kratu Hall (Boys)	47260 sft
25		Vasistha Hall (Boys)	47260 sft
26		Marichi Hall (Boys)	47260 sft
27		Pulastya Hall (Boys)	47260 sft.
28		Pulaha Hall (Boys)	363620 sft.
28		Angira Hall (Girls)	24160 sft.



29		Arundhati Hall (Girls)	58100 sft
30		Anuradha Hall (Girls)	35000 sft.
31		Visakha Hall (Girls)	35000 sft.
32		Rohini Hall (For Girls)	35000 sft.
		Total	787180 sft
Details of Staff Quarters			
33	A-1 Bungalow	1 No.	4725 sft
34	C	4 Nos.	12352 sft
35	D/TD	11 Nos.	15400 sft
36	E	18 Nos	20880 sft
37	F	100 Nos.	88000 sft
38	G	29 Nos.	13050 sft
39	RS	7 Nos.	3805 sft
40	4R	5 Nos.	9750 sft
41	F4R	4 Nos.	7320 sft
42	M4R	4 Nos.	7200 sft
43	5R	6 Nos.	11220 sft
44	3R	27 Nos.	29750 sft
45	F 3R	8 Nos.	8448 sft
46	Modified E	4 Nos.	3280 sft
47	E(New)	4 Nos.	2640 sft
48	B.F	2 Nos.	1720 sft
49	B.F	14 Nos.	10640 sft
50	G.E	10 Nos.	4000 sft
Total			2,54,180 sft



2.2. Selected Photographs:



Main entrance of Academic campus



Administrative block



Academic Block



Birds eye view of academic block



Library building



Biju Patnaik e-learning center



Entrance gate of a hostel



Central park at hostel



Low cost rammed earth building for coffee center



Landscaping near auditorium

3. Objectives of The Green Audit:

The green audit is carried out to promote the environment management and conservation in the University campus and around. Further, the audit aims to identify, quantify, describe and prioritize framework of environment sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To introduce and make students aware of real concerns of the environment and its sustainability.
- To secure the environment and cut down the threats posed to human health by analyzing the pattern and extent of resource use on the campus.
- To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections require high cost.
- To bring out a status report on environmental compliance.



3.1. Methodology

The audit was carried out by questionnaire, physical inspection, observation and review of documentation, interviewing key persons. The major topics focused in the audits report are the management of Water, Waste, and Greeneries in, and around the University campus.

4. Outcomes

4.1. Water audit

The water audit is an onsite survey and assessment to determine the current usage of water and future need, and to improve the efficiency in its use. The water audit included the water supply, consumption, and appliances and fixtures.

4.1.1. Observations

The University receives 2,00,000 L/day of water from Sambalpur Municipal Corporation through Public Health Department which is used for laboratories, lavatories, gardening and drinking purpose. A well maintained treatment plant is available at the source of water supply. Further, it is mentioned that for obtaining drinking water number of water purification filters are positioned at different strategic locations of the University campus. During the survey, no loss of water is observed, neither by leakage nor by the overflow of water from the overhead tanks. The data collected from all the departments are examined, and verified. On average, the total use of water in the University is 2,00,000 L/day, which includes 90,000 L/day for domestic purposes, 40,000 L/day for gardening and 70,000 L/day for different laboratories. The water used for drinking purpose analyzed as per IS 10500:2012 - drinking water specification and observed to be potable.

The wastewater generated from the Laboratory is stored and treated before disposal. Whereas domestic wastewater is treated in the septic tanks and soak pits.



4.1.2. Drinking water analysis report

A. Organoleptic and Physical Parameters

Sl.	Parameter	Result	Acceptable Limit as per IS 10500:2012
1	Colour (Cobalt Scale) (part 4 of IS 3025)	2 Units	5 units
2	Odour (part 5 of IS 3025)	agreeable	agreeable
3	pH Value (part 11 of IS 3025)	7.4	6.5-8.5
4	Turbidity	0.2 NTU	1 NTU
5	Total Dissolved Solids (mg/l)	96 mg/l	500 mg/l
6	Calcium (as Ca) (mg/l)	5 mg/l	75 mg/l
7	Chloride (as Cl) (mg/l)	16.2 mg/l	250 mg/l
8	Fluoride (as F) (mg/l)	0.15 mg/l	1.0 mg/l
9	Iron (as Fe) (mg/l)	0.05 mg/l	0.3 mg/l
10	Magnesium (as Mg) (mg/l)	4 mg/l	30 mg/l
11	Nitrate (as NO ₃) (mg/l)	0.2 mg/l	45 mg/l
12	Sulphate (as SO ₄) (mg/l)	4.5 mg/l	200 mg/l
13	Total Alkalinity	40 mg/l	200 mg/l
14	Total Hardness (as CaCO ₃) (mg/l of CaCO ₃)	27 mg/l	200 mg/l

B. Bacteriological Analysis

Sl.	Parameter	Result	Acceptable Limit as per IS 10500: 2012
15	<i>E. coli</i>	nil	nil
16	Total Coliforms	nil	nil

4.1.3. Recommendations

- Dependency on municipal corporation should be reduced. It can be achieved by minimizing the dependency for toilets and gardening.
- Dependency on rainwater harvesting need to be increased.



- Drip/sprinkler irrigation system should be used in gardens for minimizing the water consumption.
- In campus small scale/medium scale/ large scale reuse and recycle of the water system is necessary

4.2. Waste generation and treatment

Solid waste generation and management is a burning issue. Unscientific handling of solid waste can create threats to everyone. Therefore, this audit is conducted to addresses waste production and disposal of different wastes like paper, food, plastic, biodegradable waste, glass, dust etc. and their recycling. Furthermore, solid waste often includes wasted material resources that could otherwise be channelled into better service through recycling, repair and reuse. The survey focused on volume, type and current practice of solid waste management.

4.2.1. Observations

The total solid waste collected in the campus is around 250kg/day. Waste generated from canteen and tree droppings is a major solid waste in the campus. The waste is segregated at source by providing separated dustbins for the biodegradable and non-biodegradable waste. The biodegradable wastes generated from mess kitchen, canteen and plant litters were collected and used for composting. The paper wastes especially the cardboards are generally sold to the recyclers. To reduce the paper consumption and paper waste generation the University follows double-sided printing on papers for official purposes. Segregation of chemical waste generated in laboratories is also in practice.

Single-side used papers are reused for writing and printing in all departments. Important and confidential reports/ papers are sent for recycling to authorised recycler department after completion of their preservation period. Complying with government rules plastic has been banned. Metal waste and wooden waste are stored and given to authorized scrap agents for further processing. Glass bottles generated in laboratories are reused. The food waste from canteen and tree droppings is sent to vermicompost. All the laboratories are installed with fire extinguishers for an emergency.



4.3. E-waste Generation

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. Although, E-wastes makes up about 5% of all municipal solid waste worldwide but is much more hazardous than other waste because electronic components contain cadmium, lead, mercury and Poly-Chlorinated Biphenyls (PCBs) which are equivalently damaging for human health and environment.

4.3.1. Observations

E-waste generated in the campus is very negligible. The campus has a total of 1028 computers and laptops, 95 printers, 18 Xerox machines, and 29 scanners in working condition. The cartridges of printers are refilled and reused. The administration conducts awareness programmes regarding e-waste management with the help of various departments. The e-waste and defective items from the computer laboratory are stored properly. These electronic waste materials such as computer, computer peripherals, printer, scanner etc., where they can be reused/recycled safely, are handed over to the needy organization/department. For the remaining wastes, the institution has decided to contact a disposal facility and approved e-waste management for disposing of those wastes scientifically.

4.3.2. Recommendations

- As far as possible electronics instruments from reputed companies, and with a better life span should be purchased.
- E-waste generated at the University should be sent to recycle and reuse.



Solar cell in the University campus

4.4. Land Use and Green area

This includes the available area under construction and open space available for plantation to ensure that the buildings conform to green standards. This helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

4.4.1. Chart showing Available area and area under construction.

Facility	Rooms	Carpet area Sqm.
Large ClassRooms	12	700
Small ClassRooms	69	5824
Laboratories for UG and PG Programs	49	9500
Computer Lab	3	360
Library	1	1265
Workshop	1	1675
Administrative Block	20	3,771
Seminar Hall	6	639



idea and importance of trees in life. There are several perennial plantspecies in the campus. University has undertaken various activities like plantation and beautification of campus through various drives.

4.4.5. List of Plants

Sl.No.	Name of the Plant	Habit	Family
1	Terminalia chebula	Tree	Combretaceae
2	Terminalia belerica	Tree	Combretaceae
3	Madhuca longifolia	Tree	Sapotaceae
4	Acacia auriculiformis	Tree	Mimosaceae
5	Anthocephalus Cadamba	Tree	Rubiaceae
6	Alstonia scholaris	Tree	Apocynaceae
7	Hamelia Patens	Shrubs	Rubiaceae
8	Bougainvillea spectabilis	Climbers	Nyctaginaceae
9	Ocimum sanctum	Herb	Lamiaceae
10	Carica papaya	Herb	Caricaceae
11	Cymbopogon citratus	Herb	Poaceae
12	Azadirachta indica	tree	Meliaceae
13	Tectona grandis	tree	Lamiaceae
14	Mangifera indica	tree	Anacardiaceae
15	Ficus benghalensis	tree	Moraceae
16	Millettia pinnata	tree	Fabaceae
17	Syzygium cumini	tree	Myrtaceae
18	Aegle marmelos	tree	Rutaceae

19	Caesalpinia pulcherrima	tree	Fabaceae
20	Peltophorum pterocarpum	tree	Fabaceae

4.4.6. Selected Photographs of plantation and beautification and cleaning drive



4.4.7. Recommendation

- The University has ample green area and has utilized the available space generously in this regards. However, the University could make an understanding with local bodies to contribute to greening the spaces available with the local bodies.



4.5. Environmental Audit

This includes the assessment and monitoring of air quality, and noise levels in around the University.

4.5.1. Air Monitoring

Air quality in the academic institute is very important for the health of the students, faculty and staff of the institute. The air pollution sources in the University campus are wind, pollen grains, natural dust, vehicular emissions, and laboratory and AC fumes etc. All the pollutants were measured using standard air monitoring methods. The air pollutants monitored on regular basis are sulphur dioxide (SO₂), nitrogen oxide(NO₂), Suspended Particulate Matter (SPM), and Repairable Suspended Particulate Matter (RSPM) etc. Other relevant parameters such as temperature, humidity, pressure, and rainfall are also monitored.

Air quality near the main gate

A. Meteorological Data / Environmental Conditions

- Average wind velocity : 0.98 km/h
- Prominent wind direction : W-E
- Relative Humidity (Max./Min.) : 83/23 %

B. Air quality Report

Parameter	Result	NAAQS #2019
Sulphur Dioxide (SO ₂)	2.7 µg/nm ³	20 µg/m ³ 24-hour mean
Nitrogen Dioxide (NO ₂)	1.8 µg/nm ³	40 µg/m ³ annual mean
Particulate Matter (size less than 10 µm) or PM ₁₀	5.0 µg/nm ³	20 µg/m ³ annual mean
Particulate Matter (size less than 2.5µm) or PM _{2.5}	2.6 µg/nm ³	10 µg/m ³ annual mean
Ozone (O ₃)	Negligible	100 µg/m ³ 8-hour mean
Lead	nil	0.50 µg/m ³ annual mean



Carbon Monoxide (CO)	negligible	2 µg/m ³ 8-hour mean
Ammonia (NH ₃)	negligible	100 µg/m ³ annual mean

4.6. Noise Environment

The noise level measurements were carried out using the Noise Level Meter. The noise level survey was carried out at seven locations, both circulation area as well as the study area. The University is 15 kms away from the District Headquarters and 2 kms away from the National Highway and train line. The noise levels monitored in the University campus as well as inside the classroom and found the noise level within the permissible limit.

Sl. No.	Location	Minimum Reading In dB	Maximum Reading In dB	Limits
1	Near Main Gate	26	42	75
2	Near back Gate	18	38	75
3	Inside Class room	32	46	75
4	Outside Class room	27	40	75
5	Inside Library	20	25	75
6	Inside Chemistry lab	22	27	75
7	Inside Computer Centre	20	25	75

4.6.1. Recommendation

- Stand of tall trees should be planted along the front boundary wall to reduce noise and air pollution from the roadside.
- Use proper acoustic in rooms installed with heavy machines. Improved damping for machine vibration and sound.
- A continuous air monitoring system should be procured for measurement of air pollution.

5. Conclusions

There is significant environmental awareness amongst the faculty, staff, students and initiatives taken by them are substantial. The installation of solar panels, paperless work system, composting, besides



environmental awareness course initiated by the administration shows how the campus is going to be a Green Campus. Few recommendations are added to curb the menace of waste management using eco-friendly and scientific techniques.

As part of the green audit of the campus, the auditing carried out for monitoring of water, waste, e-waste, greenery, ventilation, illumination, air quality, noise level inside and around the campus has been carried out. It was observed that illumination and ventilation are adequate considering natural light and air velocity present. Noise level in the campus is well within the limit. The green audit report is one of the useful means of demonstrating an organisation's commitment to openness and transparency. To promote continuous improvement it is recommended to conduct the next green auditing during the year 2021.

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