VIT®
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Green Audit Report / Environment Audit Report

For

Educational Institution Campus

At

S.F. No. 600/1A, 600/1B, 600/2, 601/1A, 608/1, etc. of Katpadi Village,
S.F.No. 9/1, 9/2, 10/1, 10/2, etc. of Kangeyanallur Village
and S.F. No. 351/1, 352/2, 353/1A, etc. of Brammapuram Village,,
Katpadi Taluk, Vellore District, TamilNadu.

Submitted to

M/s. Vellore Institute of Technology- Vellore Campus,
Tiruvalam Rd, Katpadi, Vellore, Tamil Nadu 632014

Prepared by

Eco Services India Pvt. Ltd.
No. 1/134, Dhanakotiraja Street, Sundar Nagar
Ekkaduthangal, Guindy, Chennai – 600032
Tel: +91-44-30683067/43102232 Fax: +91-44-30680006

Preface

Vellore Institute of Technology was established with the aim of providing quality higher education on par with international standards. It persistently seeks and adopts innovative methods to improve the quality of higher education on a consistent basis. The campus has a cosmopolitan atmosphere with students from all corners of the globe. Experienced and learned teachers are strongly encouraged to nurture the students. The global standards set at Vellore Institute of Technology in the field of teaching and research spurs us on in our relentless pursuit of excellence.

Institutional self-inquiry is a natural and necessary outgrowth of quality of higher education. Vellore Institute of Technology leads the green initiative to promote sustainable practices in its lush and verdant campus. A few remarkable programmes include energy conservation, water conservation and waste recycling. The in-house transportation policy and the extensive research programmes are certain other sustainable initiatives to uphold green values.

Concern about environmental degradation and realization of values of environment are logical consequences of scholarly research, teaching and learning process. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generation of students, Vellore Institute of Technology has made a self-inquiry on environmental quality of the campus with the following objectives: (i) To establish a baseline of existing environmental conditions with focus on natural and physical environment; (ii) To understand the current practices of sustainability with regard to the use of water and energy, generation of wastes, purchase of goods, transportation, etc; (iii) To promote environmental awareness through participatory auditing process; and (iv) To create a report that document baseline data of good practices and provide future strategies and action plans towards improving environmental quality for future.

This report is prepared by M/s. Eco Services India Pvt. Ltd., Chennai. Eco Services audit team has undergone physical inspection during January 2021 of the campus and reviewed the relevant documents. Interaction with the various stake holders of the campus and the data provided to us, the observations and suggestions of Eco Services team is provided herewith. Upon implementation of the suggestions it will help the university to achieve the long term goal on environmental sustainability.

ECO SERVICES INDIA PVT. LTD. No.1/134, Dhanakotiraja Street, Sundar Nagar, Ekkaduthangal GUINDY, CHENNAI-32

CONTENTS

List of Annexures

1.0 Executive Summary

In accordance with the Environmental Management Plan of VIT, the Audit and Evaluation Branch conducted a green audit of the institute in July 2022.

The purpose of the audit was to ensure that the practices followed in the campus are in accordance with the Green Policy adopted by the institution. With this in mind, the specific objectives of the audit were to evaluate the adequacy of the management control framework of Environment Sustainability as well as the degree to which the Departments are in compliance with the applicable regulations, policies and standards.

An analysis was conducted during initial planning of the audit in order to identify, evaluate and prioritize the risks associated with the environmental sustainability. The analysis was based upon an examination of the policies, manuals and standards that govern the environmental sustainability, on data analysis, and on the results of preliminary interviews with personnel considered key in the environmental management in the campus. The criteria and methods used in the audit were based on the identified risks.

The methodology used included physical inspection of the campus, review of the relevant documentation.

2.0 Statement of Assurance

This audit has been conducted in accordance with the International Standards for the Professional Practice of Internal Auditing.

In our professional judgment, sufficient and appropriate audit procedures were completed and evidence gathered to support the accuracy of the conclusions reached and contained in this report. The conclusions are based on a comparison of the situations as they existed at the time of the audit with the established criteria.

3.0 Summary of Findings

The main findings of the audit show that, in general, all the departments and students are aware about the need for environmental protection at a general level. It was also observed that a number of best practices such as maintaining potted plants, introducing plastic free zone, using renewable energy sources, Energy efficient devices etc. are followed in the campus.

4.0 Audit Framework and detailed findings

The following audit framework is used for conducting Green Audit. The framework also lists the findings and observations for every criterion.

Control Objective	Control(s)	Audit Observation
Maximize the proportion of waste that is recycled & minimize the quantity of non-recyclable refuse	Reduce the absolute amount of waste that it produces from VIT staff offices. The paperless policy helped them lot in minimal paper usage and then waste.	The university has control to reduce the absolute amount of waste that it produces from staff offices. The recyclable such as papers, plastics, glasses and metals are segregated from source itself. Separate bins with different color coding is provided for collection of these. (Blue: paper waste, Green Glass wastes, Yellow Plastic wastes and Red: Metal scraps) The segregated wastes are being sent to the recyclers.

	Compost, or cause to be composted, all organic waste, green waste and un-recycled cardboard produced in or collected from kitchens, gardens, offices and rooms. Vermicomposting facility in the campus very effectively used for agricultural wastes.	All organic waste, green wastes are composted in the campus and the un-recycled cardboard send to the recyclers. The food waste collected from the kitchen send it to the nearby villages for cattle feed.
	Recycle or safely dispose of white goods, computers and electrical appliances.	Safe disposal being practiced through authorized agents for computers and electrical wastes. The Purchase Department is taking responsible for the disposal of defective equipment's and all other consumables, surplus, obsolete material, goods, equipment, Motor Vehicles, E Scrap to the recyclers.
	Collection and safe disposal of Bio medical waste.	The bio medical waste collected from the campus is being collected and disposed through the authorized Bio medical waste vendor as per the Bio-Medical Waste Management Rules, 2016.
	Collection and safe disposal of Hazardous waste	The hazardous waste such as used oil collected from the DG sets, Discarded cotton waste, filters are collected and segregated and disposed through the authorized vendor as per the Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2016.

The details of waste generation is given in Annexures.		
Maximize the usage of Energy efficient appliances, Reduce energy consumption, especially of energy derived from fossil fuels	Look in to the possibility of on-site generation of renewable electricity.	New buildings such as PRP, R block, New railway Subway-pathways, 2 MLD STPS, 3 MLD STPS are planned for installing SPV. Solar panels are installed in the roof tops for renewable electricity to the maximum extent possible: 2113 kWp
	Given preference to the most energy efficient and environmentally sound appliances available, this includes only using energy-saving light bulbs	The LED bulbs are used as much as possible i.e. more than 60 %. For the new buildings energy efficient fans, 5 star rated pumps, VFD based lifts are used in new buildings
	Encourage staff, students and conference guests to save energy through visible reminders, incentives and information to increase awareness. This particularly concerns turning off electrical appliances when not in use.	Misuse of electricity is controlled by turning off the appliances when not required. Lifts are stopped in particular floors and not in all the floors. More awareness programs and signage boards are arranged.
	Monitor and understand the importance of different sources of college energy consumption, and set appropriate and measurable targets for a reduction in certain areas of consumption and/or in the overall consumption of energy.	VIT established very good awareness among the students and staffs on energy saving. Also the conventional split ACs is replaced in a phased manner in the campus. Water chilled and air cooled (VRV) systems are consuming only 40 % and 65 % of energy respectively when compared to conventional.
	Conduct switch off drills at regular intervals	No, college do not conduct switch off drills at regular intervals

	Ensures that all electronic and electrical equipment's, such as computers, are switched off when not in use, and is generally configured in power saving mode when such option is available	It is practiced and awareness created periodically.
Minimize consumption of Water.	Repair sources of water leakage, such as dripping taps and showers as quickly as possible.	Regular checking and maintenance of pipelines are done to control water wastage.
	Install appliances which reduce water consumption	Practiced as much as possible via sensor based taps and sprinklers
	Encourage a decrease in water usage among staff, students and conference guests	Water consumption is minimal and reused for flushing purpose of treated through STP.
	Water recycling	From STP the treated waters are reused for flushing, raw water of HVAC and gardening purpose
Ensure that environmental awareness is created	Conduct environmental awareness workshops as a part of the program.	We have an active Eco club for monitoring this.
	Conduct events such as plant trees to spread environmental awareness among the students	Seminars and awareness programmes are conducted periodically on Nature and natural resources, wildlife for the conservation of Biodiversity.
	Create awareness of environmental sustainability and takes actions to ensure environmental sustainability.	Seminars and awareness programmes are conducted periodically on Nature and natural resources, wildlife for the conservation of Biodiversity.
	Reduce the rate at which the University contributes to the depletion and degradation of natural resources	University does not directly or indirectly participate in depletion and degradation of natural resources.

Ensure that the buildings conform to green standards.	Review architecture of existing buildings and reviews ways, in consultation with experts, to reduce usage of energy for such buildings, offering greatest efficiency for energy and water usage, and reducing carbon emission	Newly built Gandhi block is recognized as platinum rated green building by IGBC.
Ensure that the Environmental Policy is enacted, enforced and reviewed	Establish a University Environmental Committee that will hold responsibility for the enactment, enforcement and review of the Environmental Policy. The Environmental Committee shall be the source of advice and guidance to staff and students on how to implement this Policy	University has an Environment Committee.
	Ensure the Nature Club there will be appropriate representatives of the relevant college departments and authorities – such as catering, gardening, maintenance, cleaning and finance	Representative from all such departments.
	An Environmental Committee will be the Green Officer from an external agency who is engaged in the profession of providing guidance on environmental impact	We have green officer in the Environment Committee.
	Ensure that the Environmental Committee will review the Environmental Policy on an annual basis, and will monitor progress and set measurable targets wherever possible	Ensured
	Ensure that the Environmental Policy is enforced regardless of whether its requirements exceed the mandate of the law	Green policy is enforced.
	Require that every staff and student member recognizes their responsibility to ensure that the commitments in the Environmental Policy are properly put into practice	Members of Environment Committee are trying their best.

	Ensure that an audit is conducted annually and action is taken on the basis of audit report, recommendation and findings	Green audit is conducted annually.

5.0 Objectives and Scope

The purpose of this audit was to ensure that the Green Policy is followed and implemented in the campus, across all the departments, administrative bodies and students.

6.0 Methodology

In order to meet its objectives, this audit combined physical inspection with a review of relevant documentation and interviews with various stakeholders.

6.1 Review of the Documentation

For the purpose of this audit the Green Policy of the institute was reviewed. Other relevant standards, such as ISO14001, Green audit frameworks etc., were also considered.

6.2 Interviews

Interviews were conducted with the faculty members, staff members and students.

6.3 Physical Inspection

The audit team was in the University to inspect the campus.

7.0 Declaration

I agree with all the recommendation and observation mentioned in this report.

Original signed by

Registrar

REGISTRAR
Vellore Institute of Technology (VIT)
(Deemed to be University under section 3 of UGC Act, 1956)
Vellore-632 014, Tamil Nadu, India

Annexure 1

Solid Waste Management

As per the manual on municipal solid waste prescribed by Central Public Health and Environmental Engineering Organization (CPHEEO), the quantity of solid waste generated varies between 0.3-0.6 kg/capita/day. The solid waste will comprise biodegradable waste e.g. domestic waste, food waste, horticultural waste etc. and recyclable waste, like plastics, paper etc., and inert fractions.

It is estimated that municipal solid wastes is being generated in the following passion:

Project component	Occupancy Rate @	Per Capita generation	Total Bio Degradable Waste generation Kg/day	Total Non-Bio Degradable Waste generation Kg/day	Total solid Waste generation Kg/day
Staff Quarters Population	830	0.6	317	158	475
Non-Teaching Staff Population	1600	0.3	205	116	321
Non Resident Teaching Staff Population	1800	0.3	175	117	292
Resident Staff Population	425	0.6	177	78	255
Students (Days Scholars) Population	7784	0	0	0	0
Students (Hostlers) Population	19305	0	0	0	0
Visitors & Maintenance Staff Population	800	0.3	168	72	240
Canteen (Seating Capacity)	6200	0	0	0	0
STP Bio Sludge			60	0	60
Total			**1102**	**541**	**1643**

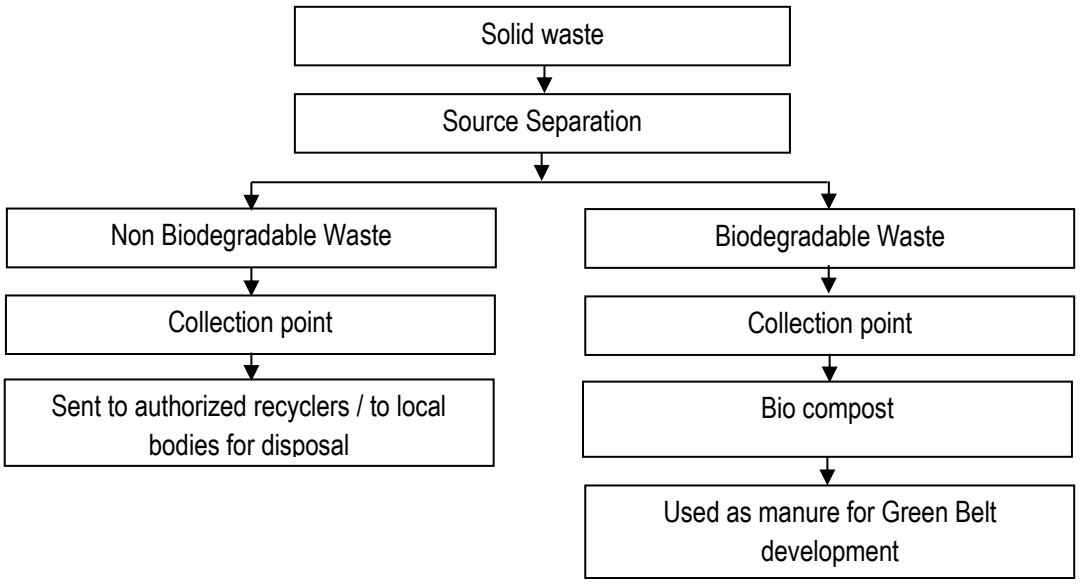
Biodegradable wastes : 1.1 Tons/day
Non-biodegradable wastes : 0.6 Tons/day

On campus, private sweepers are engaged in handling domestic waste. An adequate number of collection bins separately for biodegradable and non-biodegradable waste has been provided as per the Municipal Solid Waste (Management and Handling) Rule, 2000. Waste from such bins is collected separately on a daily basis and taken to a separate centralized collection facility. The final segregation of solid waste into a biodegradable, non-biodegradable, and inert fractions is done in the centralized collection facility. The biodegradable wastes are collected and composted

at the campus itself. The food waste collected from the canteen is being sent to the nearby village for cattle feeding. The non-biodegradable wastes are given to the authorized recyclers.

Horticulture wastes leaves, grass and vegetative residues are being collected at the secured location such that it will not hinder daily activity schedule or washed away by the surface run-off causing choking of drains, etc. and being separately treated and disposed off along with biodegradable waste through vermicomposting unit in the campus and the manure is used for agriculture department and gardening.

The solidified sludge from the STP is being stabilized and dewatered, composted along with the organic wastes and used as manure.

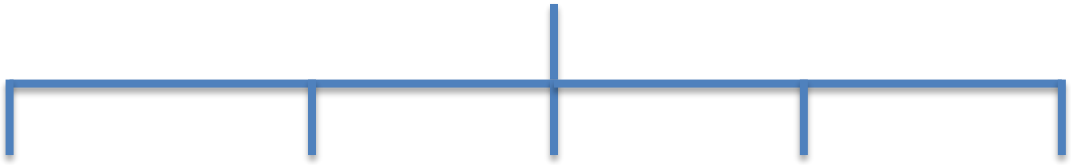


Waste Segregation System

Integrated and sustainable solid waste (without food waste and garden waste)

Inorganic waste

Types of waste from segregation



- **Papers - White & Color papers, used paper cups, cartoon box etc.,**
- **Plastic - Pet Bottles, original & dummy plastics, polythene cover etc.,**
- **Iron - Used iron & steel, aluminum tin etc.,**
- **Bottles - Used bottles, clothes, slippers etc.,**
- **Inert waste - Chocolate papers, thermocoal etc.,**

PRIMARY SEGREGATION OF WASTE AT VIT CAMPUS

The inorganic waste (i.e waste excluding food & plant waste) generated at VIT campus is to be segregated at the source for the easy disposal.

A. Awareness for Housekeeping staff and students on Primary Segregation of Waste, Staff and the students to be oriented on the type of waste generated and need for reducing and reusing substances that falls under the category of inorganic waste.

B.Supplying Waste collection Bins

C.Disposal of waste from VIT campus. The waste will be removed from the bins and will be transported out of VIT campus

D.Recycling of inorganic waste
Tins,Plastics and papers are sold at waste resale market, Inert waste is disposed at the Corporation yard.

FOUCS & PURPOSE OF WASTE MANAGEMENT :

REUSE OF WASTE MATERIALS.

REDUCTION IN USE OF RAW MATERIALS.

RECYCLING OF MATERIALS - > formation of some old type products.

Ex : Used Aluminium Cans, Papers, Plastics and Glass Bottles are melted and recast into New Cans, Papers, Plastics and Bottles.

Primary Secreation Station

Work order for collection of reusable waste

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Contract renewal for Zero waste management (Garbage's clearance services)

Date : 01-07-2021

To
M/s. Green Global India
No.28, 1st East Main Road,
Gandhi nagar (east),
Silkmill stop, Vellore-632006
Tel: +91 7539965827 / 0416 - 2246462

Sir,

Sub: Renewal-Zero waste management services(Garbage Clearance)-at VIT, Vellore campus-Reg.
Ref : Your proposal dated 10-06-2021.

-::-

With reference to the above cited in subject and reference, we are pleased to renew the contract from 01-01-2021 to 31-12-2022 for the following waste management services at VIT, Vellore campus including all hostels.

Scope of work :

Sl.No.	Description of services	Price/Month
01	Cleaning of garbage services on daily basis along with recyclable items from all points as directed by Facility management and yearly once hostel clearance of wastages when student vacate hostel and disposing of all old exam papers as per the direction of COE through purchase office.	2,50,000.00
	Add. GST 18%	45,0000.00
	Grand total in Rs.	**2,95,000.00**

Terms & Conditions

Price - as noted above inclusive of all charges.
Wastage clearance - On daily basis.
Contract period - 01-01-2021 to 31-12-2022 (Both days included).
Treat existing waste completely and make a campus clean.
Removal of all non degradable waste completely out of campus.
Payment : Rs. 2,95,000/-(inclusive of GST) per month shall be paid on monthly basis for the whole contract period 01-01-2021 to 31-12-2022.
VIT shall not provide any additional charges other than this contract and no revision of charges allowed during the contract period.

We request you to send the acknowledgement and receipt of the contract to reach us immediately.

Thanking you,

For Vellore Institute of Technology,

Registrar

Vellore Institute of Technology REGISTRAR Vellore - 632 014, Tamil Nadu

Accepted by
For Green Global India
Green Global India
PROPRIETOR

Vellore - 632 014, Tamil Nadu, India; Phone: (Direct) 91 - 416 - 2202019, 2242515, Institute: 91 - 416 - 2243091 (10 Lines)
Fax: 91 - 416 - 2243092, 2240411; E-mail: purchase@vit.ac.in
www.vit.ac.in

Solid waste segregation & Storage facility

Common waste

Organic Waste

Waste Segregation

Waste collection Storage and Processing

Vermicomposting Unit

VIT established a state of art facility called Vermi composting unit to handle the bio degradable waste and convert that in to manure for the agriculture. The Yield potential is of 10 tons per month.

Image 1


Image 2

Image 3

Image 4

Annexure 2

Hazardous Waste Management

This indicator addresses hazardous waste, laboratories, medical waste, art supplies, colors, dies and chemicals used in campus maintenance. Hazardous materials represent significant risks to human health and ecological integrity. They often persist in the environment leaving a legacy of land and water contamination for generations. Many accumulate in the tissues of organisms and become concentrated within food chains, leading to cancer, endocrine disruption, birth defects, and other tragedies. The minimization, safe handling, and ultimate elimination of these materials are essential to the long-term health of the planet. For environmental sustainability the drainage of chemical laboratory collected in air tight cement chamber and frequently the chemical waste from chamber is sent for recycle or for scientifically destroys process.

The other hazardous waste such as used oil collected from the DG sets, discarded cotton waste, filters are collected and segregated and disposed through the authorized vendor as per the Hazardous and Other Wastes (Management and Transboundary Movement) Amendment Rules, 2016.

E - Waste Management

E-waste can be described as consumer and business electronic equipment that is near or at the end of its useful life. E-waste 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 Polychlorinated biphenyls (PCBs) that can damage human health and the environment. E-waste generated in our college is of schedule III and is generated is very less in the institute is handled, treated and disposed in scientific way through authorized persons.

Scrap disposals

Policy for Scrap Disposal

The Purchasing Department will be responsible for the disposal of defective equipment's and all other consumables, surplus, obsolete material, goods, equipment, Motor Vehicles, free samples, E Scrap by the method which obtains Best Value for money including:

Intimation to registered scrap dealers through mail telephone to visit scarp site for survey and quote submissions is given. Disposal of Old items recovered during execution of project to be auctioned and final authority on price and supplier shall be made by committee.

Green procurement policy

As a part of our ongoing commitment to improve the environment, this policy seeks to reduce the environment impacts of our operations and promote sustainable development by the integration of environment performance considerations in the procurement process.

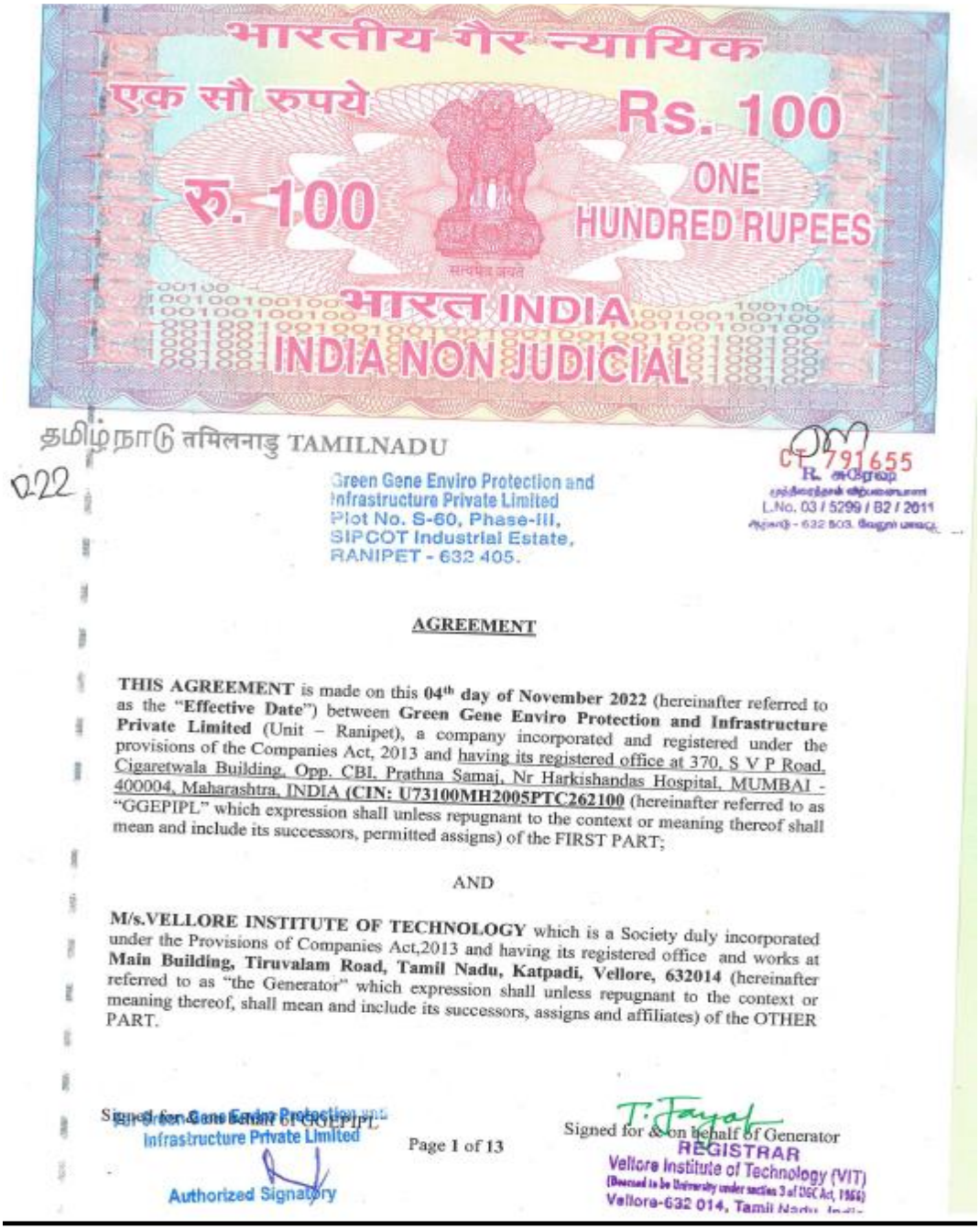
VIT encourage and prefer eco-friendly products, which are more power efficient. We shall prefer to purchase from a source that is less polluting or uses clean technology and also encourage and prefer vendors who use recycled packaging material. The possibilities of further reuse and/or recycling shall be explored with the user based on needs and other conditions.

Procurement preference would be given to the vendors those who obtained ISO 14000 Certificate. Before sending the scrap material, they have to be first declared unserviceable or scrap by the competent authority. For most of the materials Respective Department Heads / Director of the Departments are competent to classify the materials as unserviceable or Scrap.

VIT committed to the integration of environment performance considerations in the procurement process including planning, procurement, use and disposal. We are committed to considering the environmental aspects, potential impacts and costs, associated with the life cycle assessment of goods and services being acquired.

Collection of Hazardous waste and non – Hazardous waste

Agreement is executed between **Green Gene Enviro protection and infrastructure ad VIT** to collect and manage the chemical waste produced from the academic and research labs.



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தமிழ்நாடு तमिलनाडु TAMILNADU

CT 791655

Green Gene Enviro Protection and Infrastructure Private Limited
Plot No. S-60, Phase-III,
SIPCOT Industrial Estate,
RANIPET - 632 405.

AGREEMENT

THIS AGREEMENT is made on this **04th day of November 2022** (hereinafter referred to as the "**Effective Date**") between **Green Gene Enviro Protection and Infrastructure Private Limited** (Unit – Ranipet), a company incorporated and registered under the provisions of the Companies Act, 2013 and having its registered office at 370, S V P Road, Cigaretwala Building, Opp. CBI, Prathna Samaj, Nr Harkishandas Hospital, MUMBAI - 400004, Maharashtra, INDIA **(CIN: U73100MH2005PTC262100** (hereinafter referred to as "GGEPIPL" which expression shall unless repugnant to the context or meaning thereof shall mean and include its successors, permitted assigns) of the FIRST PART;

AND

M/s.VELLORE INSTITUTE OF TECHNOLOGY which is a Society duly incorporated under the Provisions of Companies Act,2013 and having its registered office and works at **Main Building, Tiruvalam Road, Tamil Nadu, Katpadi, Vellore, 632014** (hereinafter referred to as "the Generator" which expression shall unless repugnant to the context or meaning thereof, shall mean and include its successors, assigns and affiliates) of the OTHER PART.

Signed for Green Gene Enviro Protection and Infrastructure Private Limited

Authorized Signatory

Page 1 of 13

Signed for & on behalf of Generator

REGISTRAR

Vellore Institute of Technology (VIT)

(Deemed to be University under section 3 of UGC Act, 1956)

Vellore-632 014, Tamil Nadu, India

Agreement copy for collection of Hazardous waste and non – Hazardous waste

Annexure 3

Environmental Management Plan

Core committee planned to attain more net zero buildings and from there net positive buildings are targeted Also water and energy management awareness and saving are planned rigorously to reach all the stakeholders of the campus. The entire exercise of green audit concluded that the institution administration is keen on all the environmental issues. Institution have a lot to gain by following links to work towards making a green campus and more environmental friendly campus. Students, staff, faculty and administration working together will produce the best results raising awareness and helping to maintain the environmental friendly agenda in front of campus.

Annexure 4

Water Consumption and Management

The total water requirement during operation is 2756 kLD. The wastewater generation from the project is about 2700 KLD, which is treated in the sewage treatment plants of 10 different capacities of STP and is being recycled for flushing and gardening. The total capacity of STP is 8000 KLD. The details of water requirement and the water balance chart are shown in table below;

Project component	Occupancy Rate @	Per Capita per day (LPCD)	Water requirement for Non-Flushing @(LPCD)	Water requirement for Flushing @(LPCD)	Total water requirement (lts.)
Staff Quarters Occupancy	830	135	74700	37350	1,12,050
Non-Teaching Staff	1600	45	24000	48000	72,000
Total Non-Resident Staff Population	1800	45	27000	54000	81,000
Total Resident Staff Population	425	135	38250	19125	57,375
Students (Days Scholars)	11000	45	1,15,000	2,30,000	3,95,000
Students (Hostlers)	25500	135	22,95,000	11,47,500	34,42,500
Visitors & Maintenance Staff	900	45	13500	27000	40,500
Canteen (Seating Capacity)	6200	45	0	0	1,19,000
Water Requirement for Green belt development			-	-	8,00,000
Water required for Water chiller Centralised AC plant					3,50,000
Total [flushing, garden and HVAC feed water will be used from recycled water of STP] [=Total – flushing-garden- HVAC]			25,87,450	-15,62,975	54,69,425
					27,56,450

About 50% of the total water demand is being met through the recycled water from the STP's which used for toilet flushing and green belt development within the premises. For this duel piping system has been incorporated in the campus.

Total STP Capacity of **Waste water generated 10 different capacities in kLDs of**

- 95 % of the used water is recycled for
- Dual plumbing – Flushing - Gardening
- Input to Chiller Plants
- Vehicle Washing (Cars and Buses)

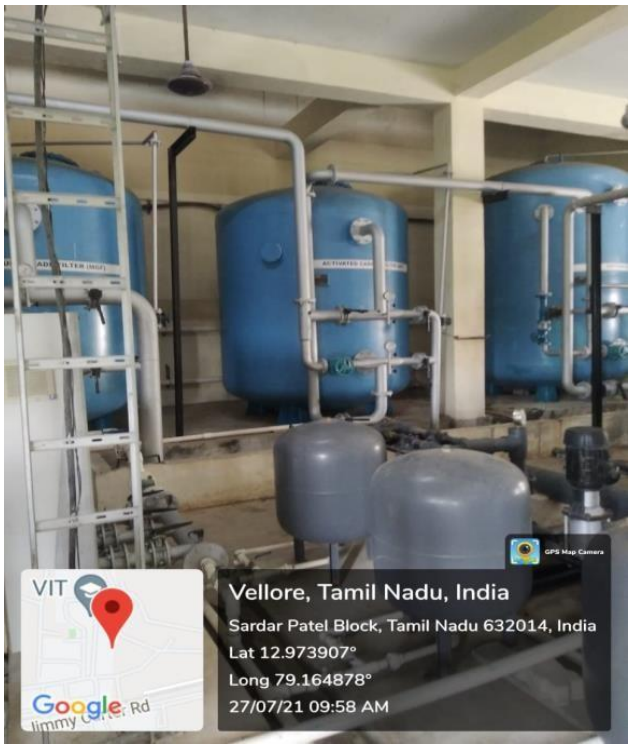
Annexure 5

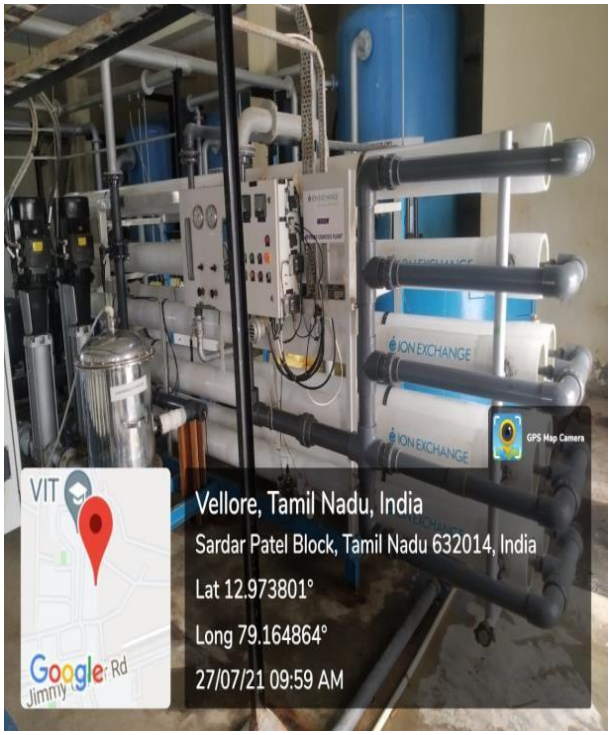
Water and Waste water treatment facilities (STP, WTP & RO)

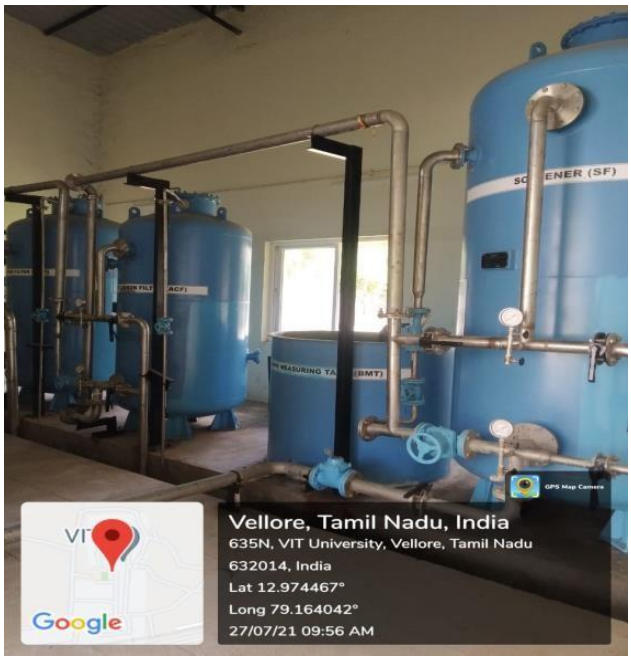
Sewage Treatment Facility (STP)


SHOT ON REDMI Y3
AI DUAL CAMERA

Water Treatment Plant (WTP)







Reverse osmosis Plant (RO Plant)

Annexure 6

Rain Water Harvesting

Rainfall

Vellore City receives rainfall during North-East Monsoon (Oct - Dec) and South-West Monsoon (June - September). A major portion of the rainfall is during North-East Monsoon. Sometimes the city also receives rainfall during January and February, but that is quite rare.

The annual rainfall in Vellore is in the range of 800- 900 mm. However, this rainfall occurs in short spells of a few days - on an average we receive rainfall for 300 hours throughout the year. The characteristics of our rainfall demands not only to conserve large quantity of rainwater during these few days but also to store wherever it rains in Metropolitan cities like Vellore, and outer stretch of the Vellore preferably for direct use and alternatively as ground water. Failure to do so will result in flooding of low lying areas and wastage by means of run-off into the sea during rainy season and water scarcity during summer months. Also, due to the fast rate of urbanization, the city has become a concrete jungle and it is very difficult to find open surfaces which would enhance the recharge of ground water. Even the open space left is paved with concrete or bitumen which does not allow the natural recharge of ground water. This highlights the need to implement measures to ensure that the rain falling over a region is tapped as fully as possible through appropriate water harvesting techniques for recharging the ground water aquifers as well as for direct storage and use of rain water.

Rain harvesting system

Keeping in mind the importance of water and it scarcity it is implemented to conserve water by rainwater harvesting by which the subsoil water condition / moisture content is maintained / improved to a great extent. Also to harvest rainwater from the terrace area, collect the same in a rainwater collection sump of suitable capacity and re-use for domestic purposes with the provision of a filtration unit. The rainwater collected from open paved and landscape area is being collected in the storm water drain which is connected to Rainwater recharging pit.

Rain Water Harvesting Pit

The rain harvest pits of suitable size are constructed along the rainwater collection drain. The rain harvest pit consists of 1.2 dia borehole for depth of 3 m. Boreholes are made with casing pipes in position, and then filled up with 10 % of Fine sand and second layer is filled up with 20% of core sand and third layer is filled with 20 % of 20 mm Jelly stones and fourth layer is filled with 40 mm jelly stones for reaming 50% of area.

Taking into consideration the intensity of rainfall in the last 10years, which is considered as 900 mm/year, an effective scheme for rain water disposal has been designed. The run off rain water rooftop is being drained out effectively by providing sufficient number of rain water outlets. These pipes are routed with necessary slope and dropped vertically down to horizontal stack at stilt floor ceiling level .The Rain water pipe has been taken to ground through retaining wall. At ground level through a network of Upvc/RCC hume pipes with suitable diameter and catch basin/saucer drain of suitable sizes for surface catchments, the rain water is finally terminated to the harvesting pit of suitable capacity. Set of Rain water down takes are connected to a Horizontal header on basement ceiling and terminating to Rain water storage tank, where the rain water will be reused for domestic usage after necessary treatment .Overflow water is being pumped to the external rain water drainage system and let into the lake.

Rain Water Harvesting facilities

S1.No	Name of the Building	Bore Height	No. of. Bores	Bore Dia	PVC Pipe Height	No. of Pipes
1	Main Building	Water sent to well through filter media				
2	Anna Auditorium	Water sent to well through filter media				
3	Library Building	52’0”	4 Nos.	9”	10’ 0”	4 Nos.
4	Hexagon Building	52’0”	4 Nos.	9”	10’ 0”	4 Nos.
5	L.H. M & N Block	53’0”	4 Nos.	9”	10’ 0”	4 Nos.
6	Workshop & Health Centre	53’0”	4 Nos.	6 ½”	10’ 0”	4 Nos.
7	Guest House	25’0”	1 No.	6 ½”	10’ 0”	1 No.
8	Canteen	13’0”	1 No.	6 ½”	5’ 0”	1 No.
9	Car parking area	50’0”	4 Nos.	9”	10’ 0”	4 Nos.

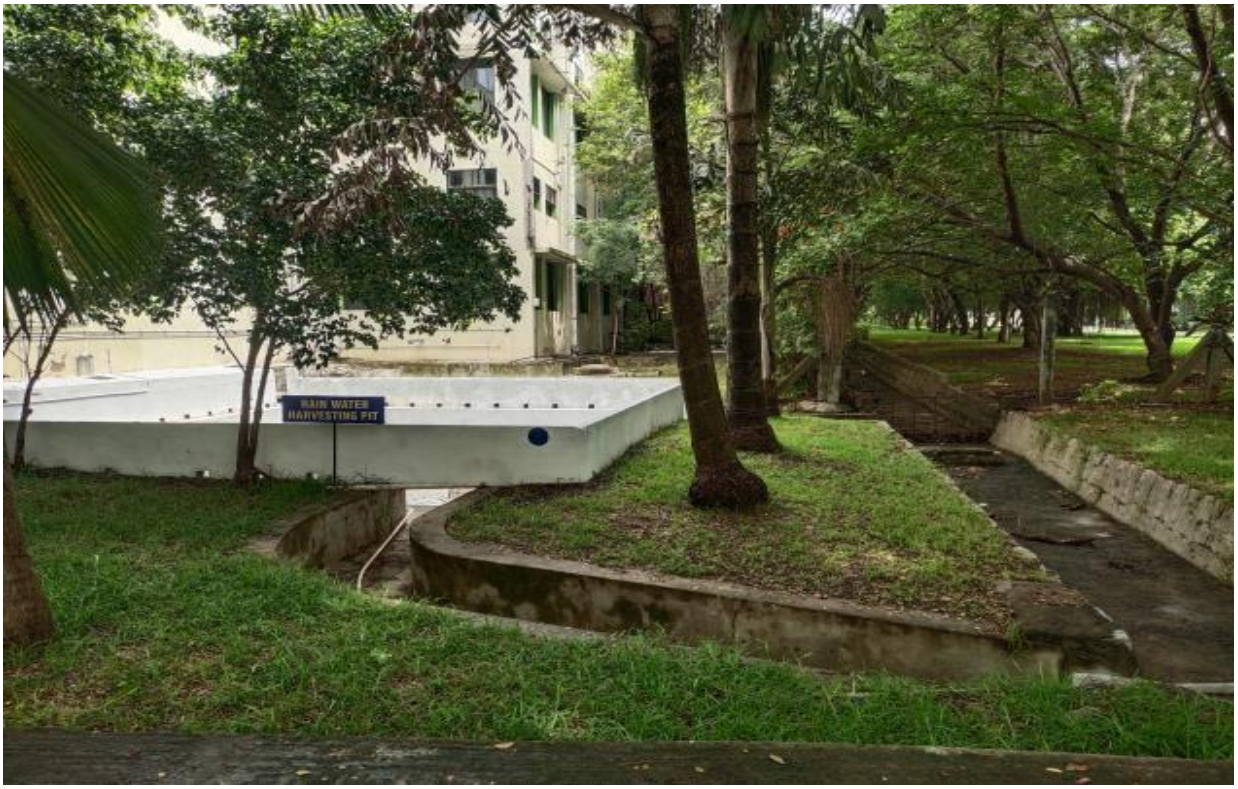
10	L.H. 'C' Block	58'0"	4 Nos.	6 ½"	10' 0"	4 Nos.
11	L.H.E & F block	Water sent to well through filter media				
12	Technology tower	Rainwater harvesting sent to towards lake just behind the building				
13	Cdmm building & car parking	65'0"	4nos	6 ½"	10'0"	4nos
14	Homeland	65'0"	4nos	6 ½"	10'0"	4nos
15	Men's Hostel 'A' Block	41'0"	1 No.	9"	10' 0"	1 No.
16	Men's Hostel 'A' Block	72'0"	2 Nos.	9"	10' 0"	2 Nos.
17	Men's Hostel 'A & C' Block	85'0"	3 Nos.	9"	10' 0"	3 Nos.
18	Men's Hostel 'D' Block	50'0"	3 Nos.	9"	10' 0"	3 Nos.
19	Men's Hostel 'E' Block	62'0"	3 Nos.	9"	10' 0"	3 Nos.
20	Men's Hostel 'F' Block East	74'0"	3 Nos.	9"	10' 0"	3 Nos.
21	Men's Hostel 'F' Block West	62'0"	3 Nos.	9"	10' 0"	3 Nos.
22	Men's Hostel H and J Block	Rainwater harvesting sent to towards lake just behind the building				
23	Men's Hostel K and L Block	45'0"	10 Nos	6"	10'0"	10 Nos
24	Men's Hostel M Block	250'0"	4 Nos	4 ½"	40'0"	4 Nos
25	Men's Hostel N Block	250'0"	4 Nos	4 ½"	40'0"	4 Nos
26	Biomass area	50'0"	6 Nos.	6 ½"	10' 0"	6 Nos.
27	Stadium	53'0"	4 Nos.	9"	10' 0"	4 Nos.
28	Stadium	37'0"	4 Nos.	9"	10' 0"	4 Nos.
29	Near Railway Gate (Culvert left)	60'0"	4 Nos.	6 ½ "	10' 0"	4 Nos.
30	Railway Gate (Culvert Right)	32'0"	4 Nos.	6 ½ "	10' 0"	4 Nos.
31	For Govt. Area V-Mess (Hill Area)	37'0"	3 Nos.	9"	10' 0"	3 Nos.
32	For Govt. Area Stadium (Hill Area)	45'0"	3 Nos.	9"	10' 0"	3 Nos.
33	G Block	40'0"	3 Nos.	6"	10' 0"	3 Nos.
34	Swimming Pool Drain	50'0"	5 Nos.	6"	10' 0"	5 Nos.
35	Men's Hostel STP Plant area	45'0"	10 Nos.	6"	10' 0"	10 Nos.

Rain water harvesting through Open well recharge at VIT

Rain water harvesting pond

Bore well Recharge by Piped water from the terrace

Bore well Recharge by Natural drain water



Annexure 7

Renewable Energy

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliances, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment. However, many may not realize how much influence the higher education sector has in the larger energy market. Energy sources utilized by all the departments and common facility centers include electricity.

Major use of energy is in office, canteen, hostels and laboratories for HVAC, lighting, and laboratory work. The total connected load is 16850 kVA and sanctioned demand from TNEB is 10500 kVA. The VIT campus is achieved utilizing the Solar Energy to generate 2179201 kWh out of the total consumption. Also VIT is executed two agreements for procuring wind power through third part power purchase with Bharath enterprises and BBK shoes of the quantities of 95 Lakhs and 28 Lakhs units per annum respectively. Furthermore the followings are adopted as energy conservation measures in the campus.

Transformer and Diesel Generator Details

Sl.No.	Power House	Transformer	Qty	Total Capacity	Generators	Qty	Total Capacity	Remarks
1	University Power House	2000 kVA	1	3000 KVA	500 KVA	3	2310 KVA	1 DG-Kirlosker
		1000 KVA	1		810 kVA	1		
2	Tech Tower Power House	800 KVA	2	1600 KVA	500 KVA	2	1250 KVA	
					250 KVA	1		
3	East Campus Power House	1000 KVA	3	3000 KVA	500 KVA	3	1500 KVA	
4	Hostel Power House-1	630 KVA	1	3430 KVA	500 KVA	2	1430 KVA	
		800 KVA	1		250 KVA	1		
		1000 KVA	2		180 KVA	1		
5	Hostel Power House-2	1000 KVA	2	2000 KVA	500 KVA	3	1000 KVA	
6	Hostel Power House-3	1000 KVA	2	2000 KVA	500 KVA 810 kVA	1 1	2460 KVA	1 DG-Kirlosker
					650 kVA	1		

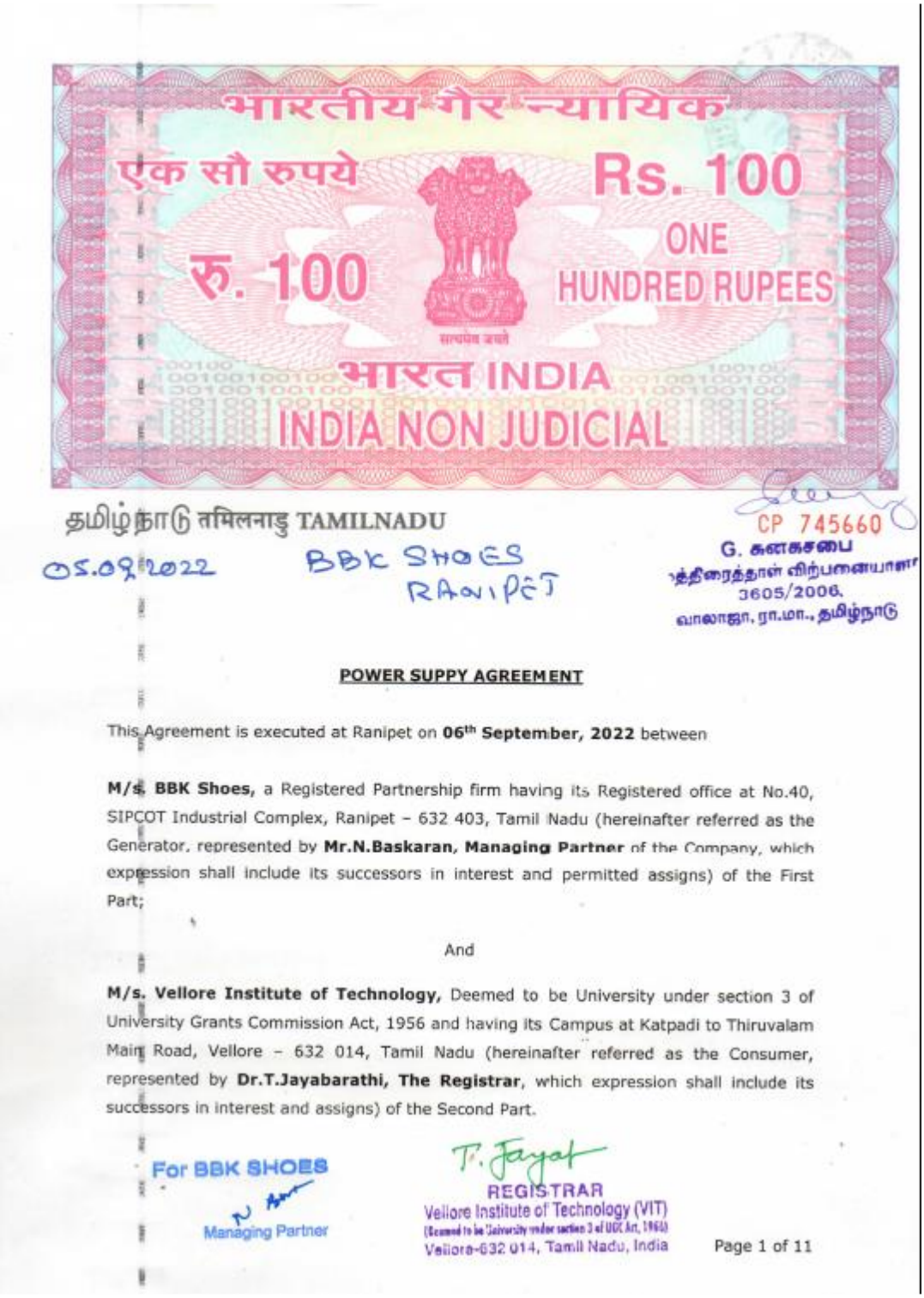
7	Home Land				250 KVA	1	250 KVA	
8	Railway Land bore well area				82.5 KVA	1	82.5 KVA	Ashok Leyland
9	LH Chiller plant	2000 kVA	2	4000 kVA	650 kVA	1	650 kVA	
10	MH Chiller plant	2000 kVA	2	4000 kVA	250 kVA	1	250 kVA	
11	VSPARC Power House	950 kVA	1	950 kVA	500 kVA	1	500 kVA	
			20 Nos	**23980 kVA**		**24 Nos**	**11882.5 kVA**	

Some of the best practices followed in Electrical and facilities Systems

a. Energy efficient LED lamps which consume 50% energy and gives more light output and therefore require less nos. of fixtures and corresponding lower wiring costs.
b. LED lamps are used for Hostel rooms, corridors areas. Also the focusing lights of metal halide and sodium vapor lamps also replaced with LED lights for the street light areas.
c. Power factor maintained at 0.98 or higher. This will reduce electrical power distribution losses in the installation.
d. All lifts are provided with AC variable voltage, variable frequency drives (ACVVF) and also lifts are configured to stop in alternate / selected floors instead of all floors when multiple lifts are provided in the buildings.
e. An APFC relay based on thyristor switching along with detuned filter / reactor is used to effect the power factor correction / improvement within a few cycles of deviation from the setting & also to reduce inrush currents.
f. Transformers have minimum no load losses as compared to conventional transformers. During the Covid period we switched of the transformers and two power houses in the hostel side are interconnected via LT and saved the no load losses of the transformers. Also the solar PV is very effectively used for the reduced load and conserved the energy.
g. All the power houses interconnected and are formed ring main; cables are derated to avoid heating during use. This also indirectly reduces losses and improves reliability.
h. Solar water heater system with heat pump concepts are used in hostels blocks which is highly energy efficient which takes only 40 % of the energy of conventional electricity based heaters.
i. Pumps used at our HVAC, STPs, WTPs and other sumps to overhead pumping are replaced with IE5 pump which is very high efficiency when compared to other pumps. Also HNS system followed in high rise buildings which is more efficient

j. Centralized chiller plant based AC system is used which is consuming 45 % energy of the conventional ACs.

Wind Power Agreement copy with BBK shoes in addition to already established agreement with Bharath enterprises for 95 Lakhs units per year



भारतीय गैर न्यायिक

एक सौ रुपये Rs. 100

रु. 100 ONE HUNDRED RUPEES

भारत INDIA

INDIA NON JUDICIAL

தமிழ்நாடு तमिलनाडु TAMILNADU

CP 745660

05.09.2022

BBK SHOES RANIPET

G. கனகசபை
முத்திரைத்தாள் விற்பனையாளர்
3605/2006.
வாலாஜா, ரா.மா., தமிழ்நாடு

POWER SUPPY AGREEMENT

This Agreement is executed at Ranipet on **06th September, 2022** between

M/s. BBK Shoes, a Registered Partnership firm having its Registered office at No.40, SIPCOT Industrial Complex, Ranipet – 632 403, Tamil Nadu (hereinafter referred as the Generator, represented by **Mr.N.Baskaran, Managing Partner** of the Company, which expression shall include its successors in interest and permitted assigns) of the First Part;

And

M/s. Vellore Institute of Technology, Deemed to be University under section 3 of University Grants Commission Act, 1956 and having its Campus at Katpadi to Thiruvalam Main Road, Vellore – 632 014, Tamil Nadu (hereinafter referred as the Consumer, represented by **Dr.T.Jayabarathi, The Registrar**, which expression shall include its successors in interest and assigns) of the Second Part.

For BBK SHOES

Managing Partner

T. Jayat

REGISTRAR
Vellore Institute of Technology (VIT)
(Deemed to be University under section 3 of UGC Act, 1956)
Vellore-632 014, Tamil Nadu, India

Page 1 of 11

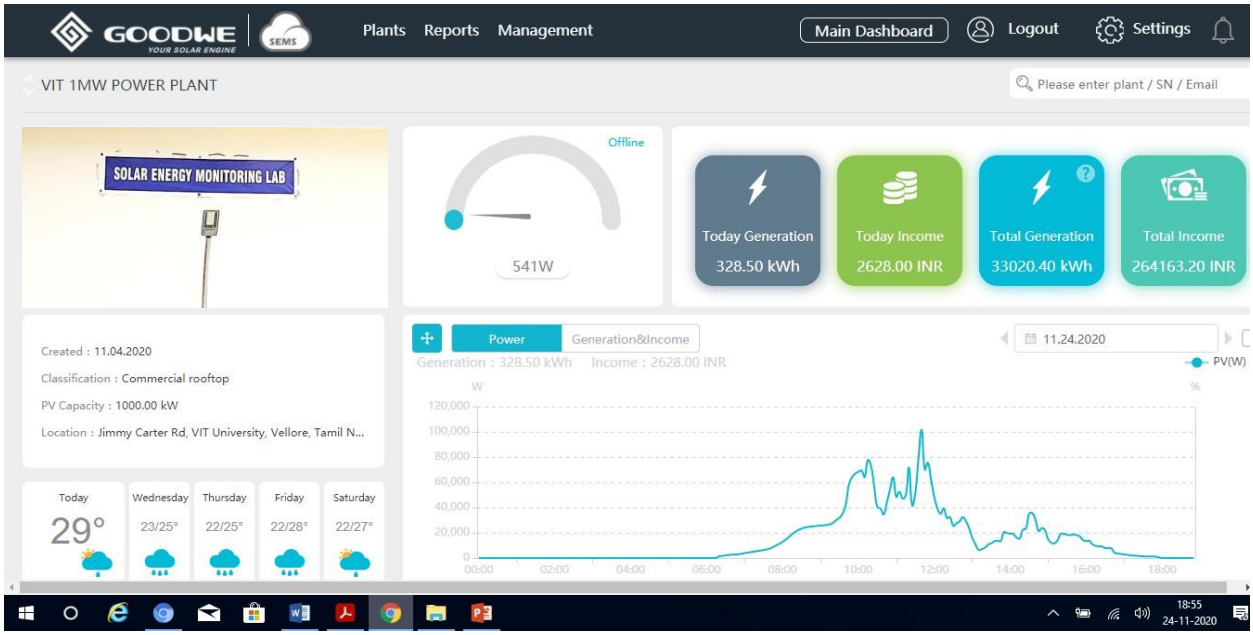
Solar Panels at VIT's building Roof top

Installed capacity – 2913.27 kW [Vellore and Chennai Campus]

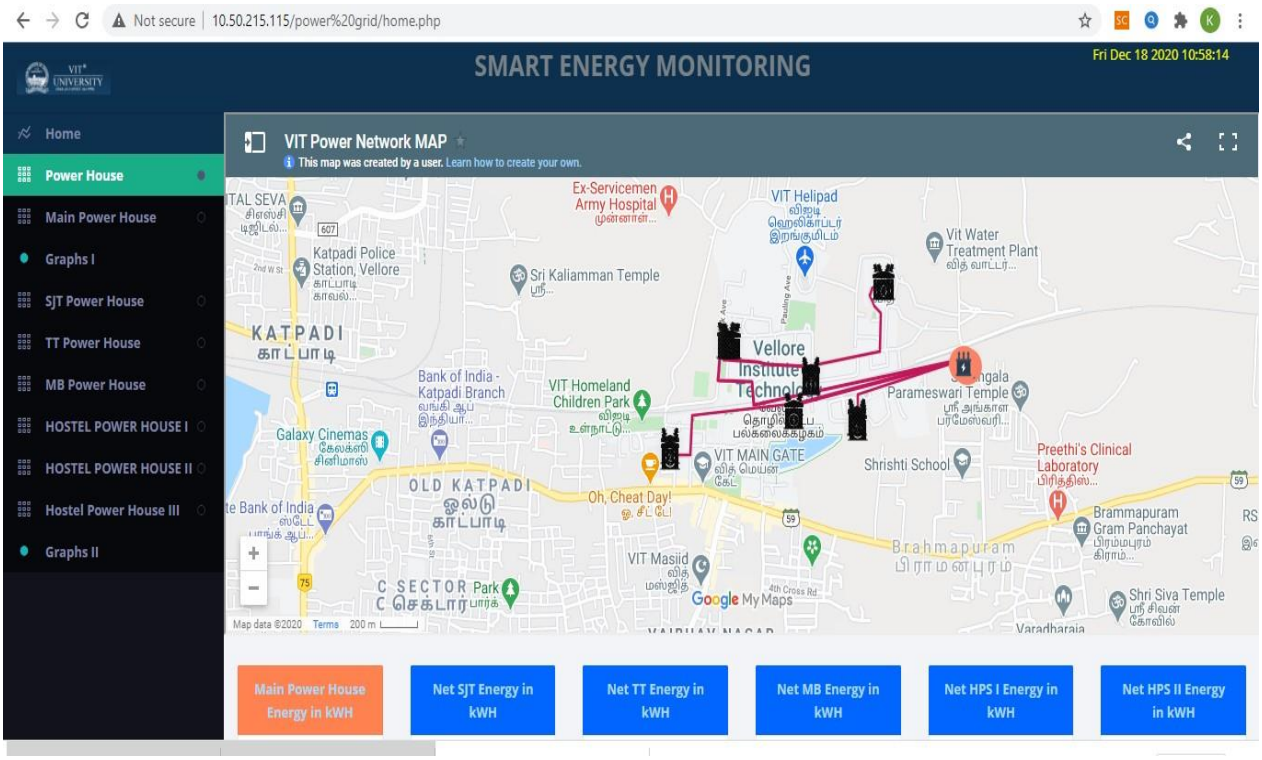

Latitude: 12.97322
Longitude: 79.164395
Elevation: 229.96m
Time: 19-01-2019 16:25
Note: Solar PV
A - Block


GDN Block

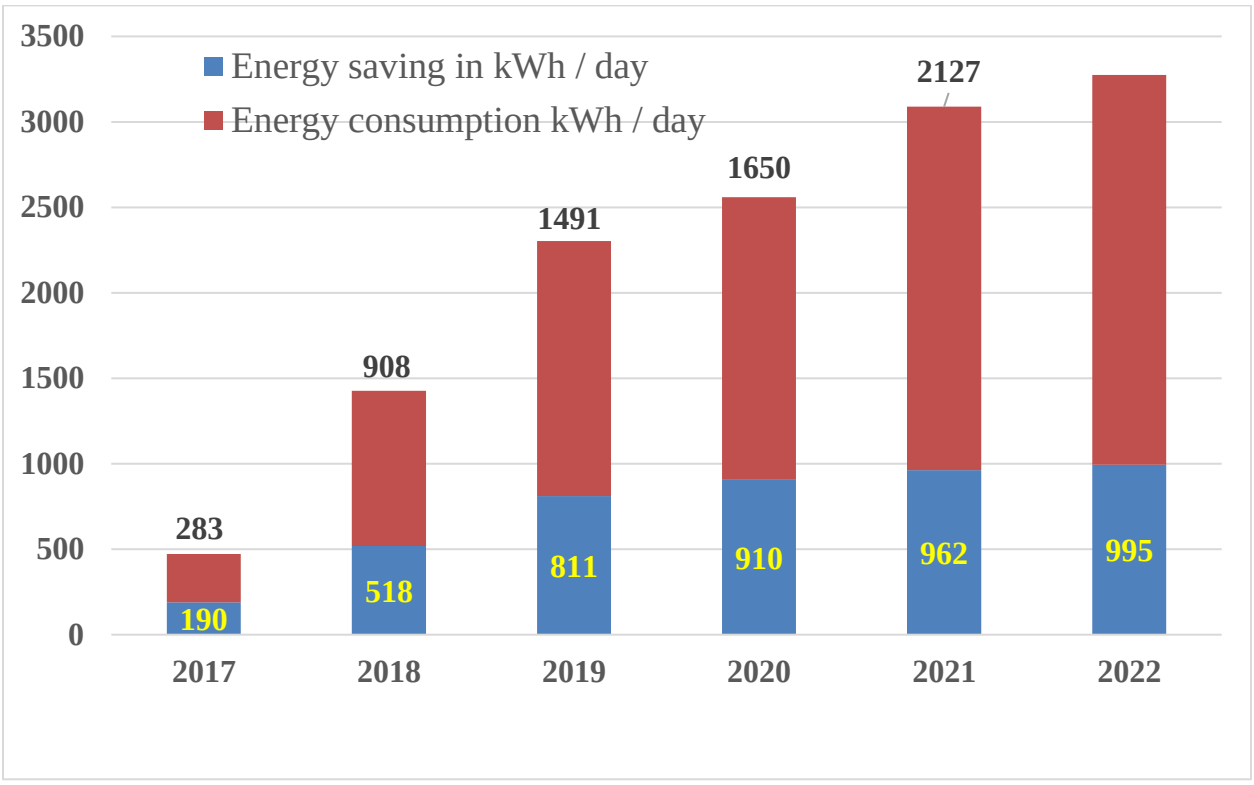
Solar PV Generation Online Monitoring



Online Energy Monitoring



Energy Saving by using LED Lights



Installed LEDs in all new buildings and renovated buildings, corridors,

Rest rooms of old buildings, street lights and focussed lights

Energy Conservation Practices

Energy Saving through Hot Water system

Solar Water Heater

Capacity – 47000

Liters per day

Heat Pump Water Heater

Capacity – 16800

Liters per hour

Electric water heater

Capacity – 34110

Liters per hour

Energy, emission and social cost of carbon savings

Savings (One-year)	
Energy (kWh)	**15,29,775**
Emission (kg of CO_2)	**13,92,095**
Operating cost (Rs.)	**1,23,14,688**
Social cost of carbon (Rs.)	**88,95,210**

Solar Water heater

Innovative Cooling System - Gandhi Block

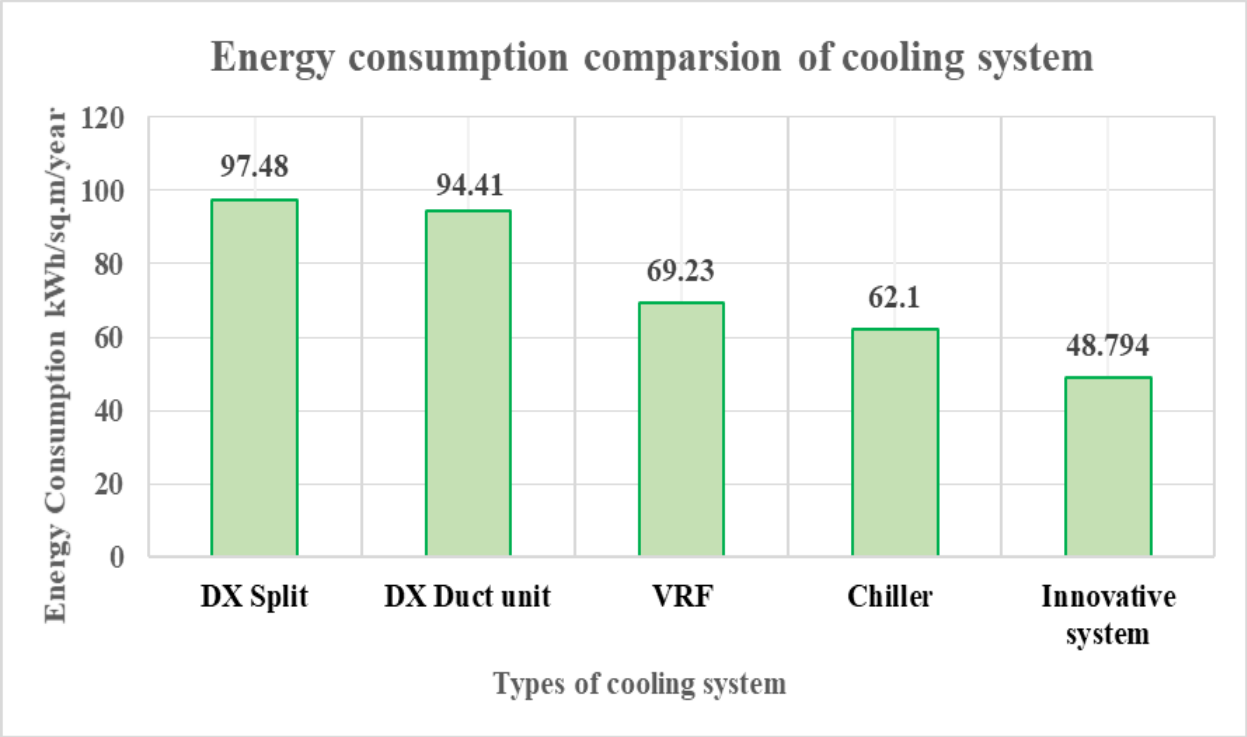
- The main aim is to develop innovative cooling system, energy efficient solution for the educational building
- To promote advancement in building thermal comfort, district energy system in accordance with India cooling action plan (ICAP)

Radiant cooling + Indirect Evaporative Cooling - open classrooms and the corridors

Radiant cooling + Chiller system - seminar halls, laboratory and closed classrooms

Energy, emission and social cost of carbon savings

Savings (One-year)	
Energy (kWh)	**3,14,160**
Emission (kg of CO_2)	**12570**
Operating cost (Rs.)	**21,99,120**
Social cost of carbon (Rs.)	**80,320**



The energy saving of the Innovative cooling system, when operated in the combined mode that is radiant and evaporative cooling, radiant and chiller saves energy on an average about 50%.

Annexure 8
CO_2 Emission

VIT calculates CO_2 emission for both the campus in Vellore and Chennai every year and aims to reduce it through activities like energy conservation, alternate energy sources, and developing more greenery inside the campus.

For CO_2 emission calculation we are considering following scopes:

Scope 1: Construction stage – raw material used for construction like – concrete, cement, steel, stones, tiles, copper, PVC, paint, glass, wood and organic materials.

Scope 2: Operational stage- Electrical Energy from Utilities, DG units, Power procured from Wind generation, roof top solar power generation, Diesel used for transportation and LPG used at hostels

3. Vegetation around the building – trees, shrubs, hedges, potted plants and agriculture

Period	**CO_2 from Construction Tons** Scope 1	**CO_2 from Operational Tons** Scope 2	**CO_2 absorption by Vegetation**	**Net CO_2 emission in Tons (Scope 1 & 2)**
Academic Year 2019-2020	41068.16	22184.6	2578.106	60674.66
Academic Year 2020-2021	29376.66	3897.763	2688.4	30586.02*
Academic Year 2021-2022	23608.93	10090.65	2757.333	30942.25*

VIT keenly working on CO_2 emission reduction by adding more alternative energy sources, procuring power from wind and solar energy through third party agreement, adopting energy efficient appliances like LED, BLDC fans, energy efficient pumps, Centralised chilled water system, solar water heater with heat pump, and developing more greenery in the campus.

* The values are low because of low students present in the campus and low construction activity due to pandemic

Annexure 9

Transportation Facilities and Carbon Footprint Reduction

Air pollution is a matter of serious concern in the campus owing to its urban location. Universities as a responsible institution understand the importance of its carbon footprint and developed a plan to reduce greenhouse gas emissions in all its activities. The endeavor is to take leadership role in environmental stewardship and become one of the nation's first institutions of higher education to accept the goal of climate neutrality by undertaking Carbon Neutrality commitment. Pollution control board was coordinated to establish the Air pollution monitoring display it in our campus.

Majority of the students in the campus are encouraged to use bicycle and not students are not permitted to use automobiles inside the campus and rely on public transport, indicating lesser carbon foot print of the student community. Also shuttle cabs services are provided within the campus to minimize the carbon foot print.

Shuttle Services


ALBERT EINSTEIN BLOCK
A

Annexure 10

Green Belt Development and Landscape

VIT University has already planted adequate numbers of saplings all along the periphery and inside the campus, roadways and available open spaces. The major aim of greenbelt development plan is to attenuate air pollutants released into the environment but it can also help in overall improvement in the environmental conditions of the campus. The plan will address the following issues such as attenuation of air pollution, noise reduction, improving the biodiversity of the region, adding aesthetics and combating soil erosion and prevention of land degradation.

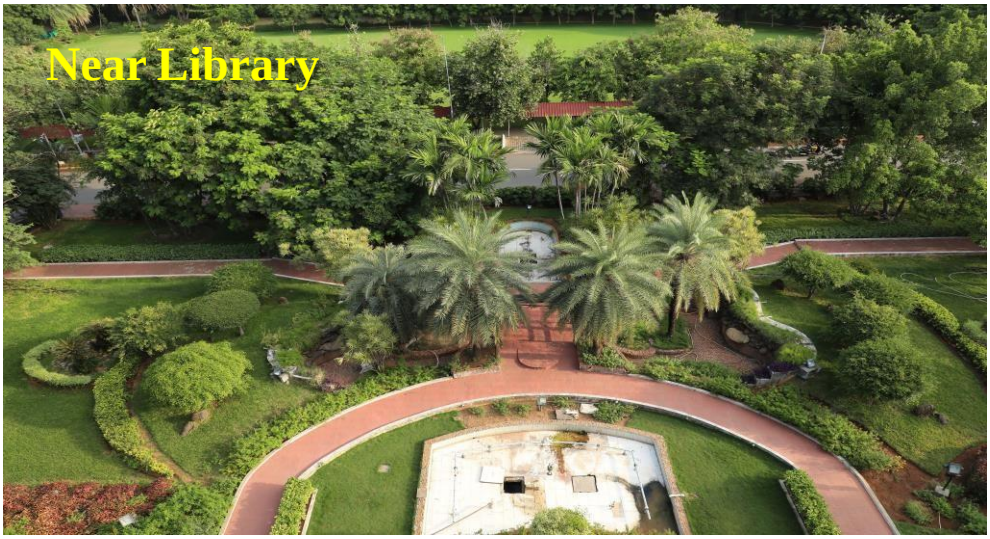
A well designed green-belt helps in intercepting particulate matter and gaseous pollutants and helps in purifying the air. Trees acts as effective barrier and absorber of noise. The green belt around the campus acts as an indicator in the event of release of gaseous emission by visible morphological changes in the leaves, stem etc. To accrue the benefits of greenbelt and to maximize its potential in environmental management around the campus, choice of the green belt tree and shrub species plays a vital role. About 29,202 nos. of trees and 1, 18,000 nos. of Shrubs are planted in 64 Acres of land and the details of trees and shrubs species are furnished below.

Trees Species	Shrubs Species
Alstonia Scholaris	Dieffenbachia
Artocarpus	Nacteria
Azardirachta	Arwa
Bauhinia	Ixora
Bignonia	Nerium oleander
Callistemon	Pentas dwarf red
Calophyllum Inophyllum	Rhaphis excels
Cassia	Tabenaemontana dwarf
Cordia	Russelia
Dalbergia	Caesalpinia
Delonix Regia	Graptophyllum
Eugenia Jambolana	Golden duranta
Ficus benjamina	Ficus
Ficus bengalensis	Acalypha nuda

Ficus religiosa	Phyllanthus snow bush
Filicium	Clerodentrum
Lagerstroemia	Acalypha rosea
Mahakani	Rhoeo discolor variegated
Mimusops	Aralia
Noble amhersita	Syzygium austral
Peltophorum	Dracaena
Pongamia	Bamboo
Plumeria	Hibiscus
Rose wood	Pseuderanthemum
Samanea saman	Schefflera variegated
Spathodea	Heliconia varieties
Tabebuia	Alpinia
Termanilia cadapa	Ficus panda
Vengai	Song of india
Molligtonia	Areca palm
Mangifera indica	Rhapis excels
Araucaria	Murraya paniculata
Dulbergia sisoo	Plumeria
Sterculya	Pennisetum
Red sandal	Phoenx palm
Simarouba	Caryota urens
Thespesia	Washingtonia filifera
Putranjiva	Furcraea
Indian aricaria	Pedilanthus
badam	Yucca
Poliyalthia	Aglaonema
Aveerhoa	Dianelia
Acacia	Allamanda dwarf
Clusia rosea	Hamelia patens
Ceiba	Bixa
Kadamba	Bamboo
Melia	Bougainvillea
Giruvillia	Euphorbia
Terminaria	Hibiscus
Tamirend	Gardenia

Kigelia	Murraya paniculata
Gmelia	Tecoma capensis(red&yellow)
Termanelia mentalaya	Plumbago capensis
Barringtonia	Pentas
Coconut	Lantana
guaicum	Lemonia spectabilis
Albezia	Beloperone
Jacranta	Lillies
Parkia	Hemigraphics
conocarpus	Agassitatio variegated
Eranthimum	pisonia alpa
pachira	Pendanus
	Costus
	Peperomia
	podocarpus
	sanzia nobillies
	Zambia
	sansevieria
	scindapsus
	Curcuma
	Vadilia
	Canna indica
	Alternanthra

Green Belt Development



Green Belt Development

Gandhi Block

Nursery near CBMR

Annexure 11

Awards and Recognition for Green Campus

VIT Vellore bags the award of **'Excellence in Green Building'** for the year 2022 organized by leading Tamil magazine Kattumana Thozhil in association with Construction Academy.

Hon'ble Governor of Tamilnadu Mr. R.N Ravi gave out this award to VIT.

Dr. S.K Sekar - Director Estates, VIT received the award on behalf of the institute.

IGBC

Confederation of Indian Industry

Indian Green Building Council (IGBC)

hereby certifies that

GANDHI BLOCK

Vellore Institute of Technology, Vellore

(IGBC Registration No: NBO 18 0124)

has successfully achieved the Green Building Standards required for the following level of certification under the

IGBC Green New Buildings Rating System

(Owner-Occupied Building)

Platinum

05 May 2022

(This Certificate is valid for 3 years from the date of certification)

C N Raghavendran
Chair, IGBC Green New Buildings

Gurmit Singh Arora
Chairman, IGBC

K S Venkatagiri
Executive Director, CII-Godrej GBC

and