

ENVIRONMENTAL AUDIT REPORT

For

GITAM UNIVERSITY



Rushikonda, Visakhapatnam

By



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Conserve Consultants Private Limited wishes to thank all the staff, Management & Technical Team of **GITAM UNIVERSITY, Visakhapatnam** for the kind co-operation and assistance extended to our Auditor during the course of the Environmental audit.

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1. EXECUTIVE SUMMARY

Environmental Audit for M/s GITAM University, Visakhapatnam was carried out by Conserve Consultants during March 2022.

The approach taken in this facility included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and associated systems & equipment.

2. PROJECT BACKGROUND

GITAM Visakhapatnam campus was established in 1980, with modern infrastructure supported by dedicated faculty and administrative staff. The campus is located in an ideal environment in the Coromandel coast area near Rushikonda Beach along Bay of Bengal, close to Visakhapatnam International Airport and at a distance of 15 km from Visakhapatnam Railway Station. The campus is provided with smart classrooms, laboratories, auditorium, seminar halls, play fields, student hostels and other student support services.

Visakhapatnam campus consists of Eleven schools: GITAM School of Technology, GITAM School of Science, GITAM School of Business, GITAM School of Pharmacy, GITAM School of Architecture, GITAM School of Law, GITAM Institute of Nursing, GITAM School of Humanities and Social Science, GITAM School of Physiotherapy, Centre for Distance learning, GITAM institute of Medical Science and Research to impart high quality training in the fields of Technology and Management in the Vizag of India.

The campus is located near the Seashore of the city. The campus has two Administration blocks, Thirty three Academic blocks, eight common amenities and facilities, and nearly about Eighty eight blocks. One spacious library building, Five Staff quarters and twelve hostels. All the academic departments have adequate number of smart classrooms, staff rooms, seminar halls well- equipped laboratories, central library, and other facilities.

3. ENVIRONMENTAL AUDIT

The main objective of the environmental audit is to promote the Environment Management and Conservation in the GITAM University Campus. The purpose of the audit is 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 the Audit are:

- To introduce and bring awareness to students on the real concerns of 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 requires high cost.

4. LIGHTING ANALYSIS

Good lighting is necessary to enable work to be done well and in comfort. A facility with bad lighting is an inefficient one, though it may look attractive. Poor lighting can be combated by good eyesight and by keenness on work but at the eventual expenses of efficiency, wellbeing and comfort. Hence, the designer of the building should pay sufficient attention to the need for good lighting.

The lighting details of the facility were studied. The various type of light fitting used are 36 W, 22W, 15W, 11W CFL Tube lights and 40W,36W, 18W Fluorescent tube lights and 20W LED Tube lights.

LUX LEVEL ANALYSIS,

S No.	Area	Lux Levels Measured at multiple spots	Baseline Lux as per NBC
GIMSR – Hospital			
1	Intensive care Unit –Emergency – GF	209, 172, 183	200-300-500
2	Neonatal Intensive Care Unit – GF	195, 181, 189	200-300-500
3	Intensive Care Unit – 1F	171, 179, 181	200-300-500
4	Staff Base-1-GF	186, 179	200-300-500
5	Staff Base -2 – 1F	181, 183	200-300-500
6	Maternity Ward – GF	142, 133, 112	200-300-500
GIMSR – Medical College			
1	Department Pharmacology Lab -3F	156, 121, 128	300-500-750
2	Department of Pathology Lab – 2F	111, 123, 127	300-500-750
3	Department of Microbiology Lab – 2F	121, 125, 138	300-500-750
4	Department of Haematology Lab – 1F	131, 144, 141	300-500-750
5	Lecture Demo-1	97, 91, 111	200-300-500

S No.	Area	Lux Levels Measured at multiple spots	Baseline Lux as per NBC
6	Lecture Demo -2	105, 117, 110	200-300-500
7	Lecture Demo -3	114, 101, 106	200-300-500
Chandrasah Bhavan (ICT)			
1	Programming Lab- 1- 1F	210, 221, 204	300
2	Department of IT Lab -1F	207, 231, 227	300
3	Lecture Hall -1	191, 183, 196	300
4	Lecture Hall -2	203, 195, 198	300
5	Communication Systems Lab- 5F	201, 193, 197	300
School Of Law (Dr. B.R. Ambedkar Bhavan)			
1	Class room -1- 1F	151, 143, 159	300
2	Staff room -1 – 3F	163, 158, 155	300
3	Library -2F	177, 141, 149	300
4	Class room – 4F	159, 154, 163	300
GITAM Institute of Management			
1	Class Room -1 -1F	205, 191, 211	300
2	Class Room -2 - 3F	194, 185, 181	300
3	Faculty Room -1F	179, 164, 169	300
4	Conference Hall	151, 158, 147	300
GITAM School Of Gandhi Studies			
1	Lecture Hall- 1F	161, 179, 173	300
2	Staff Room-1F	176, 181, 185	300
3	Lecture Hall -3F	180, 172, 175	300
Industrial Engineering Lab (IE Bhavan)			

S No.	Area	Lux Levels Measured at multiple spots	Baseline Lux as per NBC
1	CNC Machines Lab -GF	156, 148, 152	300
2	Metallurgy Lab -1F	146, 154, 135	300
3	Workshop (Electrical Wiring)	139, 143, 148	300
Central Research Lab -1			
1	Machine Shop Lab -GF	147, 156, 155	300
2	Applied Thermo Dynamic Lab -2	162, 159, 163	300
Central Research Lab -2			
1	Fluid Mechanics & Hydraulic Machines Lab	167, 155, 151	300
2	Structural Engineering Lab	158, 141, 154	300
School Of Architecture			
1	Class Room -1F	167, 159, 162	300
2	Computer Lab -2F	181, 179, 192	300
3	M. Arch Computer Lab – 4F	197, 201, 187	300
GIFT Bhavan (School Of International Business)			
1	Lecture Theatre-1–1F	205, 198, 201	300
2	Faculty Room-1F	191, 186, 195	300
3	Class Room -2F	177, 186, 185	300
Sir Arthur Cotton Bhavan			
1	Geo Technical Engineering Lab -GF	149, 155, 169	300
2	Class Room - GF	171, 167, 185	300
3	Class Room -3F	165, 171, 169	300
Institute Of Pharmacy			
1	Central Instrumentation Lab -1F	148, 151, 147	300

S No.	Area	Lux Levels Measured at multiple spots	Baseline Lux as per NBC
2	Lecture Hall -1F	155, 163, 161	300
3	Lecture Hall -3F	167, 181, 185	300
Kokila Sadan – Girls Hostel			
1	Living Room-1 – GF (Block 2)	58, 43	50
2	Living Room-1 – GF (Block 3)	71, 66	50
Nirmala Sadan -2			
1	Living Room -1 - GF	47, 59	50
2	Living Room -2 - GF	50, 53	50
Rabindra Sagar Sadan – Boys Hostel			
1	Living Room -1 - GF	58, 62	50
2	Living Room -1 – 3F	43, 59	50

Comments:-

Lux levels are below the NBC Standards. Lux level shall be improved to the acceptable limits.

LIGHTING POWER DENSITY ANALYSIS

S No.	Area	Lamp	Lamp Wattage	No. of Lamps	Total Wattage, W	Area Sq. ft.	LPD W/Sq. ft.	ASHRAE Baseline LPD W/Sq. ft.
GIMSR – Hospital								
1	Intensive care Unit – Emergency – GF	4X56	224	6	1344	689.4	1.9	2.7
2	Neonatal Intensive Care Unit – GF	4X14	56	2	112	429.4	0.26	2.7
3	Intensive Care Unit – 1F	1X22	22	16	352	3321.3	0.27	2.7
		1X56	56	10	560			
4	Maternity Ward – GF	1X20	20	22	440	2682.3	0.16	0.7
GIMSR – Medical College								
1	Department Pharmacology Lab -3F	1X40	40	6	240	2652	0.09	1.24
2	Department of Pathology Lab – 2F	1X40	40	8	320	2002.1	0.15	1.24
3	Department of	1X40	40	6	240	2631.1	0.09	1.24

S No.	Area	Lamp	Lamp Wattage	No. of Lamps	Total Wattage, W	Area Sq. ft.	LPD W/Sq. ft.	ASHRAE Baseline LPD W/Sq. ft.
	Microbiology Lab – 2F							
4	Department of Haematology Lab – 1F	1X40	40	13	520	2652	0.19	1.24
5	Lecture Demo-1	1X40	40	5	200	828.2	0.24	1.24
Chandrabhas Bhavan (ICT)								
1	Programming Lab- 1- 1F	1X40	40	22	880	1494	0.5	1.24
2	Lecture Hall -1 -GF	1X36	36	9	324	1100	0.29	1.24
3	Communication Systems Lab- 5F	1X40	40	9	360	1494	0.26	1.24
		1X20	20	2	40			
School Of Law (Dr. B.R. Ambedkar Bhavan)								
1	Class room - 1- 1F	1X36	36	3	108	342.5	0.31	1.24
2	Library -2F	1X36	36	14	504	1328.4	0.37	0.93
GITAM Institute of Management								
1	Class Room -216 -1F	1X36	36	16	576	812	0.70	1.24
2	Class Room -310 - 3F	1X36	36	16	576	812	0.70	1.24
GITAM School Of Gandhi Studies								
1	Lecture Hall-	1X36	36	2	72	767	0.11	1.24

S No.	Area	Lamp	Lamp Wattage	No. of Lamps	Total Wattage, W	Area Sq. ft.	LPD W/Sq. ft.	ASHRAE Baseline LPD W/Sq. ft.
	1F	1X20	20	1	20			
Industrial Engineering Lab (IE Bhavan)								
1	CNC Machines Lab -GF	1X36	36	14	504	1335	0.37	1.24
2	Workshop (Electrical Wiring)-4F	1X36	36	12	432	1221	0.35	1.24
Central Research Lab -1								
1	Machine Shop Lab - GF	1X36	36	38	1368	3060	0.44	1.24
Central Research Lab -2								
1	Fluid Mechanics & Hydraulic Machines Lab	1X36	36	12	432	2307	0.18	1.24
2	Structural Engineering Lab	1X36	36	12	432	2066	0.20	1.24
School Of Architecture								
1	Class Room -1F	1X36	36	10	360	430.5	0.8	1.24
2	Computer Lab -2F	1X36	36	10	360	861	0.4	1.24
3	M. Arch Computer Lab – 4F	1X36	36	3	108	430.5	0.25	1.24

S No.	Area	Lamp	Lamp Wattage	No. of Lamps	Total Wattage, W	Area Sq. ft.	LPD W/Sq. ft.	ASHRAE Baseline LPD W/Sq. ft.
GIFT Bhavan (School Of International Business)								
1	Lecture Theatre-1-1F	11X2	22	12	264	936.4	0.28	1.24
Sir Arthur Cotton Bhavan								
1	Geo Technical Engineering Lab -GF	1X36	36	18	648	1200	0.54	1.24
2	Class Room - 2F	1X36	36	4	144	799	0.18	1.24
Institute Of Pharmacy								
1	Central Instrumentation Lab -1F	1X36	36	8	288	1195	0.24	1.24
2	Lecture Hall -1F	1X36	36	6	216	756	0.28	1.24
Kokila Sadan – Girls Hostel								
1	Living Room-1 – GF (Block 2)	1X36	36	2	72	238	0.30	1.24
2	Living Room-1 – GF (Block 3)	1X40	40	2	80	238	0.33	1.24
Nirmala Sadan -2								
1	Living Room -1 - GF	1X20	20	2	40	317.5	0.12	1.24
2	Living Room	1X20	20	2	40	324	0.12	1.24

S No.	Area	Lamp	Lamp Wattage	No. of Lamps	Total Wattage, W	Area Sq. ft.	LPD W/Sq. ft.	ASHRAE Baseline LPD W/Sq. ft.
	-2 – GF							
Rabindra Sagar Sadan – Boys Hostel								
1	Living Room –RS107 - GF	1X40	40	2	80	231	0.34	1.24
2	Living Room RS403 – 3F	1X40	40	2	80	231	0.34	1.24
Sadarma Sadan - Canteen								
1	Dining Hall	1X36	36	59	2124	8189	0.27	0.90
		1X20	20	5	100			

Comments:

LPD is much within in the ASHRAE recommended limits. This is very Good and highly appreciated.

5. INDOOR AIR QUALITY

Indoor air quality (IAQ) is a term which refers to the air quality within and around buildings and structures, especially as it relates to the health and comfort of building occupants. IAQ can be affected by various gases, volatile organic compounds etc. Source control, filtration and the use of ventilation to dilute contaminants are the primary methods for improving indoor air quality in most buildings. Determination of IAQ involves the collection of air samples at various locations of the building.

During the course of audit, the Indoor air quality survey was carried out at various locations in the building.

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
GIMSR – Hospital											
1	Intensive care Unit – Emergency – GF	1187	26.9	67.7	22.2	20.1	0.001	0.124	49	56	Unqualified
2	Neonatal Intensive Care Unit – GF	659	27.5	72	23.6	22.1	0.003	0.006	49	56	Unqualified
3	Intensive Care Unit – 1F	821	24.4	49.1	17.2	13	0.001	0.033	24	30	Fresh
4	Staff Base- 1-GF	827	24.2	49.3	17.1	12.8	0.001	0.033	23	30	Fresh
5	Staff Base - 2 – 1F	831	24.5	49	16.8	11.9	0.001	0.033	24	30	Fresh

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
6	Maternity Ward – GF	583	29.3	97.2	28.9	28.6	0	0	61	70	Unqualified
GIMSAR – Medical College											
1	Department Pharmacology Lab -3F	597	30	88	28.6	28.1	0.003	0	58	67	Unqualified
2	Department of Pathology Lab – 2F	604	30.4	88	28.7	28.2	0.003	0.004	45	53	Unqualified
3	Department of Microbiology Lab – 2F	624	29.9	90.9	28.5	28.3	0.002	0.001	53	59	Unqualified
4	Department of Haematology Lab – 1F	581	30.1	88.8	28.5	27.9	0.002	0.004	39	47	Unqualified
5	Lecture Demo-1	597	30.3	88.1	28.6	28.1	0	0	60	69	Unqualified
6	Lecture Demo -2	593	30.7	88	28.1	27.7	0	0	71	81	Unqualified
7	Lecture Demo -3	589	29.8	87.3	27.9	27.5	0.002	0.005	69	81	Unqualified
Chandrasah Bhavan (ICT)											
1	Programmin g Lab- 1- 1F	578	24.5	57	18.7	15.5	0	0	52	59	Unqualified
2	Department of IT Lab -	662	29.7	89.1	27.6	27.1	0.001	0.007	67	77	Unqualified

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
	1F										
3	Lecture Hall -1	601	30.8	86.7	28.9	28.3	0.001	0	53	61	Unqualified
4	Lecture Hall -2 -GF	823	29.7	70	26.5	25.5	0.002	0	40	46	Unqualified
5	Lecture Hall -3 -GF	1071	28.7	72.4	24.5	23.1	0.003	0.006	33	38	Unqualified
5	Communication Systems Lab- 5F	842	29.8	75.7	26.2	25.1	0.002	0	41	46	Unqualified
School Of Law (Dr. B.R. Ambedkar Bhavan)											
1	Class room - 1- 1F	631	30	74.9	25.2	24.5	0.001	0	40	46	Unqualified
2	Staff room - 1 – 3F	601	30.2	73	24.1	23.6	0	0	45	51	Unqualified
3	Library -2F	820	25.1	56.4	19	16.1	0.002	0.020	33	39	Unqualified
4	Class room – 4F	627	29.8	73.7	24.9	24.3	0	0	43	49	Unqualified
GITAM Institute of Management											
1	Class Room - 216 -1F	711	27.4	98.6	27.1	27	0.002	0	38	44	Unqualified
2	Class Room - 310 - 3F	926	25.8	88.5	24.3	23.8	0.002	0.006	31	35	Fresh
3	Faculty Room -1F	687	27.1	98.1	26.8	26.5	0	0	41	46	Unqualified
4	Conference Hall	726	26.7	89	25.3	24.8	0	0	46	51	Unqualified

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
GITAM School Of Gandhi Studies											
1	Lecture Hall-1F	783	28.7	89.6	27.3	26.8	0	0	46	53	Unqualified
2	Staff Room-1F	751	28.2	88.9	26.9	26.6	0.001	0	43	49	Unqualified
3	Lecture Hall -3F	688	28.5	89.1	27.7	27.1	0	0	49	55	Unqualified
Industrial Engineering Lab (IE Bhavan)											
1	CNC Machines Lab -GF	571	29.2	79.6	26.5	25.4	0.003	0.002	32	38	Fresh
2	Metallurgy Lab -1F	720	29.5	82.1	26.9	26.1	0.050	0.001	35	40	Unqualified
3	Workshop (Electrical Wiring)-4F	567	29.9	77.3	26.6	25.3	0	0	29	34	Fresh
Central Research Lab -1											
1	Machine Shop Lab - GF	1090	27.7	96	27.2	27.1	0.002	0.023	31	35	Unqualified
2	Applied Thermo Dynamic Lab -2	634	27.9	93.2	27	26.7	0	0.012	37	44	Unqualified
Central Research Lab -2											
1	Fluid Mechanics & Hydraulic Machines	579	28.1	94	27.2	27.1	0.002	0	34	39	Unqualified

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
	Lab										
2	Structural Engineering Lab	1260	28	91.9	27	26.6	0.001	0.008	31	37	Unqualified
School Of Architecture											
1	Class Room - 1F	662	28.6	90.1	27.2	26.8	0.002	0.013	22	26	Fresh
2	Computer Lab -2F	632	30.1	83.9	27.8	27.1	0.002	0.007	32	37	Fresh
3	M. Arch Computer Lab – 4F	557	30.9	81.4	28.1	27.2	0.001	0.019	29	33	Fresh
GIFT Bhavan (School Of International Business)											
1	Lecture Theatre-1– 1F	680	23	60.1	17.7	14.8	0.001	0.020	34	39	Fresh
2	Faculty Room-1F	661	23.7	60.6	18.1	17.5	0	0	38	43	Unqualified
3	Class Room - 2F	721	23.9	61.2	18.3	16.9	0.001	0	41	47	Unqualified
Sir Arthur Cotton Bhavan											
1	Geo Technical Engineering Lab -GF	561	28.3	89.4	26.8	26.4	0	0	65	76	Unqualified
2	Class Room - GF	566	29.2	84.6	27.1	26.3	0.001	0.011	48	55	Unqualified
3	Class Room -	594	29.7	83.9	26.9	26.1	0.002	0	45	52	Unqualified

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
	3F										
Institute Of Pharmacy											
1	Central Instrumentation Lab -1F	569	28.9	77	25.7	24.5	0	0	43	49	Unqualified
2	Lecture Hall -1F	586	29.2	79.3	26.3	25.3	0	0	39	45	Unqualified
3	Lecture Hall -3F	581	28.3	75.9	24.7	24.1	0	0	41	47	Unqualified
Kokila Sadan – Girls Hostel											
1	Living Room-1 – GF (Block 2)	578	30	99.1	30.5	30	0	0	120	139	Unqualified
2	Living Room-1 – GF (Block 3)	617	29.8	99.1	29.8	29.6	0.001	0.005	84	98	Unqualified
Nirmala Sadan -2											
1	Living Room -1 - GF	572	30.5	98.9	30.4	30	0.003	0	75	87	Unqualified
2	Living Room -2 – GF	666	30.6	98.8	30.5	30.1	0.001	0.003	71	83	Unqualified
Rabindra Sagar Sadan – Boys Hostel											
1	Living Room –RS107 - GF	658	29.6	99.9	29.6	29.6	0.003	0	119	136	Unqualified
2	Living Room RS403 – 3F	647	30.2	99.7	30.3	30.1	0.003	0	94	107	Unqualified

S No.	Area	CO ₂ PPM	Air Temperature °C	RH %	WBT °C	DPT °C	TVOC mg/m ³	HCHO mg/m ³	PM 2.5	PM 10	Level of Air only based on PM2.5 & PM10
GITAM Bhavan – Admin Block											
1	Office space – Left wing – 6F	708	24.5	60	19.2	16.7	0.09	0.006	77	91	Unqualified
Nirman Bhavan –Basement Floor											
1	Electrical Office room	852	27.5	90.2	23.1	22.1	0.002	0	61	70	Unqualified
Santhi Sadan – International Hostel & Guest house											
1	Guest Room - 4F	640	26.1	99	26	25.8	0	0	33	39	Fresh
2	Living Room - GF	594	29.4	99.3	29.3	29.1	0.002	0	43	51	Unqualified
Sadarma Sadan - Canteen											
1	Dining Hall	568	30.2	99.3	30.2	30.1	0.001	0	106	121	Unqualified
GITAM Café (Medical College & Hospital – Dining Hall)											
1	Dining Hall	732	26.2	80.4	23.5	22.5	0.002	0.008	88	102	Unqualified

Comments:-

To improve the indoor air quality inside the campus, site barricading through trees/other features shall be explored to reduce the particulate pollution inside the campus from the nearby roads.

6. PERFORMANCE ASSESSMENT ON ESTIMATION OF CO₂ AND NEUTRALIZATION

Table 1:-

SI No.	Source Of Energy	Application	Source of Procurement
1	Electricity	Electrical/Electronic Equipment	Eastern Power Distribution Company of AP Limited
2	Diesel & Petrol	Transport Vehicles & DG sets	Authorized Distributors
3	LPG	Cooking	Authorized Distributors

Annual Energy consumption from different source of Energy used by the University

Table 2:-

SI No.	Month/Year	Total Electricity Units Consumed (KWH)	Transport Vehicles		DG Sets (Diesel in Litres)	LPG Consumptions (Kg)
			Diesel Consumption (Litres)	Petrol Consumptions (litres)		
1	Mar-21	365824	2750	300	1090	3515
2	April-21	654926	2596	285	2500	1045
3	May-21	467124	1970	370	950	1615
4	Jun-21	310150	2396	235	610	3040
5	Jul-21	329576	3098	240	1000	3990
6	Aug-21	457624	2926	299	600	5605
7	Sep-21	595774	3234	361	1260	10070

8	Oct-21	594724	2797	350	1290	14535
9	Nov-21	775252	2896	395	1610	12540
10	Dec-21	893328	2200	515	770	5510
11	Jan-22	774920	2915	190	1060	6650
12	Feb-22	476552	2839	310	750	8170
Average =		557981	2718	321	1124	6357
Total =		66,95,774	32,617	3850	13490	76,285

Annual CO₂ Emission by different Sources of Energy/Fuels:-

Table 3:-




SI No.	Annual CO ₂ Emission by different types of Fuels/Sources of Energy (Tons/Annum)
Electricity	5490
Diesel Vehicles	86.10
DG Sets	35.61
Petrol Vehicles	9.20
LPG	228.8

Formula Used:-

Table 4:-

Description	Formula for CO ₂ Emission Calculation
Electricity	= (kWh* 0.82 Kg of CO ₂ Emission)
Diesel	= (Diesel in Litres * 2.64 Kg of CO ₂ Emission)
Petrol	= (Petrol in Litres * 2.39 Kg of CO ₂ Emission)
LPG	= (LPG in Kg * 3.0 Kg of CO ₂ Emission)



Table 5:-

Total Estimated CO ₂ Emission per Annum	Present CO ₂ Reduction by Matured Trees planted in the University Campus	CO ₂ To be Neutralized
 58450	 332.10	 58117

From the conclusion; the management of the University has taken the steps to neutralize the CO₂ and to become a Net-Zero Carbon Emission buildings. Also it is recommended to take essential activities to neutralize the CO₂.

- Encourage the students/Staff to plant more trees and account them all.
- Install solar PV plant as this step will reduce the electricity consumption.
- Replace Exterior lamps with solar based battery operated lamps.
- Use Electrical Vehicles at least 3% because at present Campus occupants is catered through Fossil fuel based shuttle service is about 7% approximately for commute.

7 SITE OBSERVATION REPORT

Site Observation Report (SOR)			
Report No.	C&A/SOR/01	Date	16.03.2022
Location	At entrance of the University Campus and in front of the Blocks.		
Observation Images			
   			
Description			
Safety precaution awareness posters for COVID-19 are kept inside the GITAM University Campus.			
Safety Measures			
COVID -19 Safety measures protocol are followed very strictly inside the University Campus, which creates awareness among Students and Staff to maintain a social distance and wear a mask.			

Site Observation Report (SOR)			
Report No.	C&A/SOR/02	Date	16.03.2022
Location	At University near GIMSR		

Observation Images



Description

University Garden's waste (wet grass & Dry leaves) and Nursery plant wastes are segregated and sent to Natural Manure production for Soil.

Potential Sustainability Measures

Nil.

Site Observation Report (SOR)

Report No.	C&A/SOR/03	Date	16.03.2022
Location	At GIMSR Medical college		

Observation Images



Description

Bio medical wastes are collected, segregated and sent to centralized bin. On daily basis the collected Bio Medical wastes are sold to third party vendor.

Potential Sustainability Measures

Nil.

Site Observation Report (SOR)

Report No.	C&A/SOR/04	Date	16.02.2022
Location	Outside of the Campus		

Observation Images



Description

Centralized dust bins are not provided for the collection of whole campus waste. There was no waste collection bags (Oxy –biodegradable bags) are kept at individual bin for collecting and segregating Solid wastes.

Potential Sustainability Measures

Except food waste all the solid wastes are sent to Municipal landfilling (outside of the University Campus) by the Mini Tempo. It is recommended to send the waste to recyclers to reduce landfill dump yard/avoid incineration. 1. Multiple type waste bins (paper/glass/metal/plastic/e-waste) shall be kept in many places to facilitate the segregation wastes at the sources itself and then 2. Centralized waste collection area for multiple waste types so that wastes can be accumulated for period of time, which in turn will make the waste recycling economically feasible for the recycling vendors.

Site Observation Report (SOR)

Report No.	C&A/SOR/05	Date	16.03.2022
Location	External Lights on the Pathways inside the Campus		

Observation Images



Description

External lights power are not with solar PV type.

Potential Sustainability Measures

It is recommended to install Solar PV type external lights in the whole campus. It helps to reduce the energy consumption and associated carbon footprints. When the campus aims towards net zero energy/carbon, these measures could be major stepping stones.

Site Observation Report (SOR)

Report No.	C&A/SOR/06	Date	16.03.2022
Location	At Ganesh Park inside University Campus		

Observation Images



Description

Construction Wastes are sent by Tractor and dumped at back side of the Ganesh park in the University's Premises.

Potential Sustainability Measures

These Wood wastes can be used as mulch, fuel, animal bedding or sent to recycler.

Site Observation Report (SOR)

Report No.	C&A/SOR/07	Date	16.03.2022
Location	At Ganesh Park inside University Campus		

Observation Images



Description

It was observed that metal scraps are dumped inside the park.

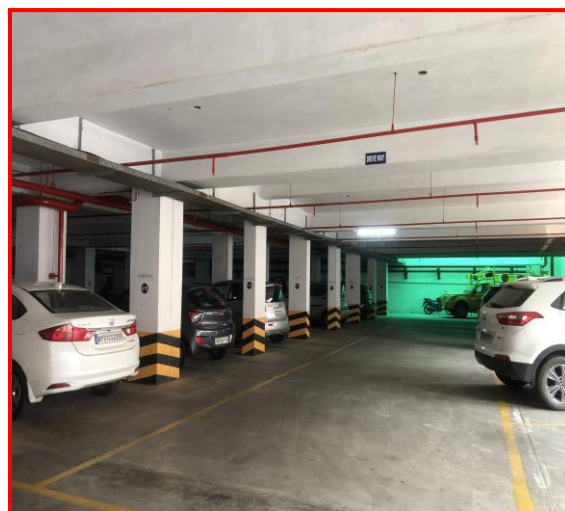
Potential Sustainability Measures

It is recommended that Metal scrap to be sold to scrap tenders who divert the material to proper place for recycling.

Site Observation Report (SOR)

Report No.	C&A/SOR/08	Date	16.03.2022
Location	Basement – Parking Area		

Observation Images



Description

It was observed that there was no Carbon Monoxide Sensors and Jet fans installed.

Potential Sustainability Measures

It is recommended to install CO Sensors to regular monitoring the pollutant level emitted by Petrol/ Diesel vehicles. And install Jet Fans for Proper Basement Ventilation and Smoke Extractions.

Site Observation Report (SOR)

Report No.	C&A/SOR/09	Date	16.03.2022
Location	GIMSR Medical college		

Observation Images



Description

It was observed that Bio medical waste electronic weighing machine is not working properly.

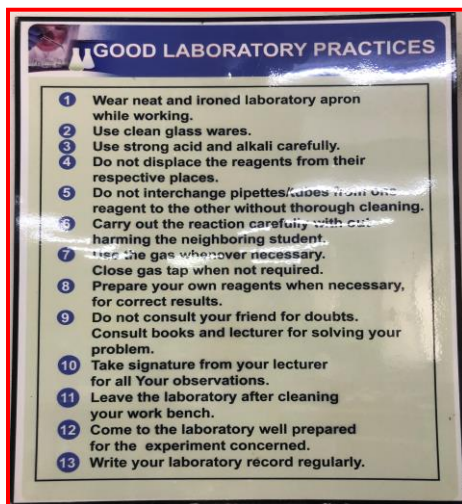
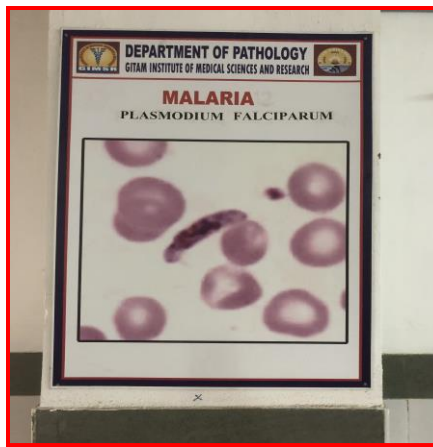
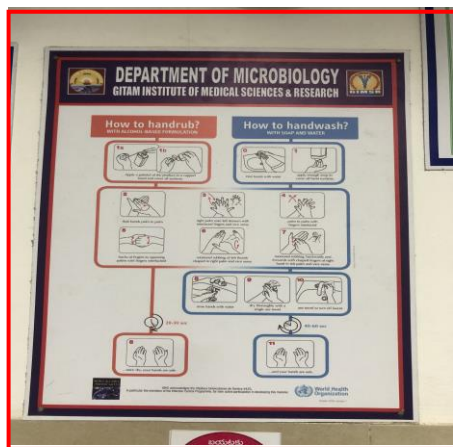
Potential Sustainability Measures

This electronic weighing scale machine should be repair, maintain and properly calibrate.

Site Observation Report (SOR)

Report No.	C&A/SOR/10	Date	16.03.2022
Location	In all the Laboratories		

Observation Images



Description

It is observed that in all the Laboratories Safety Practices, How to use Fire Extinguisher, Do's and Don't's, Good laboratory practices etc. are displayed on the wall.

Potential Sustainability Measures

It is highly encouraged practices in the Laboratories, which creates awareness and safety measures on how to handle the experiments among the students.

8 GOOD PRACTICES AT GITAM UNIVERSITY CAMPUS

During Conserve Consultant's Audit, it is observed that M/s GITAM University, Visakhapatnam Campus has already adopted the following Performance Improvement Measures in its facility;

1.1 Safety Measures for COVID-19 precautions

COVID -19 safety measure protocol is followed very strictly inside the University Campus, which creates awareness among students and staff to maintain the social distance and wear the mask.

1.2 Flora in the University's Campus

There nearly about 15234 nos. of Matured Trees, plants and Sapling are planted in the University Premises which contributes for CO₂ reductions.