

ESTATE OFFICE

Executive Summary

GREEN CAMPUS INITIATIVES

JULY 2020

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ESTATE OFFICE

VISION

- B.S. Abdur Rahman Crescent Institute of Science and Technology is committed to ensure that the built infrastructure of the institute has sustainability as a core principle, both in construction and maintenance management of the campus. Estate office aspires to follow a range of sustainable design features and practices implemented to build and maintain the institute as a complete green and sustainable campus continuously.

MISSION

- Energy and Water Conservation Measures
- Establish on campus renewable energy sources like Roof-top Solar Power Plants, water heaters, street lights and Bio-Gas plants.
- Green Belt Development
- Solid Waste Management program to separate recyclable waste and dispose all waste in non-polluting, responsible manner.
- Getting all buildings certified as Green buildings (Gold rating) under USGBC-LEED / GBCI-EDGE / IGBC rating systems.
- Follow Sustainable Construction practices.

FACT SHEET

S.No.	CRITERION
I	Renewable Energy – Solar Power Plant
1	Roof-top Solar Power Plant I of 150kWp capacity commissioned in June 2014 at a cost of 1.32Cr. Return on Investment is 1Crore till 31st July 2020.
2	Roof-top Solar Power Plant II of 100kWp capacity commissioned in October 2014 at a cost of 62Lacs. Return on Investment is 73.51 Lacs till 31st July 2020.
3	Roof-top Solar Power Plant III of 300kWp capacity commissioned in October 2018 at a cost of 1.20Cr. Return on Investment is 57.82Lacs till 31st July 2020.
4	Roof-top Solar Power Plant IV of 100kWp capacity commissioning in October 2020 at a cost of 40Lacs.(Installation Work in Progress)
5	Total power generated through the Solar PV plants is 27,04,655 units till 31st July 2020, which is equal to 43% of our annual consumption.
6	Avoided emission of greenhouse gases to the equivalent of 16,11,992kg CO ₂ due to generation of renewable energy by Solar PV power plants.
	Solar Street Light
7	Solar street lights 10 Nos provided near Architecture block and Staff quarters to Men's Hostel.
	Solar Water Heater
8	Solar Water heaters in Hostels and staff quarters – installed capacity 36,500 liters. This is equivalent to 365 electric geysers of various capacities. The power saving is estimated to be around 24 Lacs per annum.
II	Solid Waste Management
1	Solid Waste Management program is implemented – to segregate and recycle organic waste, paper, cartons, paper cups, soft drink tins, plastic, pet bottles, e-waste, bio-waste, etc.
2	250Kg Kankyo Eco bin installed in BSACIST campus for Food Waste collected from mess & kitchen. 30,735Kg Compost manure collected till July 2020 and used for landscaping.
3	Garbage incinerator machine with 50kg/hr capacity installed in solid waste management yard for reducing waste product to inert ash. Daily generation 500kg/day and generated fly ash being used as manure around 12,815 kg generated till July 2020.
4	Sanitary incinerator with wet scrubber (for pollution control) is installed for disposing the napkins. Wet scrubber is attached at the outlet of burner fumes where the fumes gets scrubbed in water and gets filtered to remove the harmful emissions.
5	Bio-gas plant of 50m ³ capacity for Ladies Hostel is commissioned in June 2017. The gas generated is utilized in Ladies Hostel Mess Kitchen.

III	Liquid Waste Management
1	Sewage Treatment Plant (STP) – 500KLD of water is treated and utilized for Landscaping and flushing purpose in the University and Hostels. One plant of 250 KLD capacity for Men’s Hostel and another 250 KLD capacity plant for University are in operation.
2	Use of eco-friendly chemicals are mandatory for cleaning the campus
IV	LED Fixtures & A/C
1	LED fixtures – of around 50.87KW capacity has been installed in all over campus in the past 6 years. By usage of LED, it is reduced around 70% of less power consumption.
2	Passive Infra-red motion sensor lights provided in Computer Science block lab and staff cabin for energy savings
3	Air-conditioning split units of 5-star BEE rating is installed in various departments in the campus for a total of 203TR.
4	All the 203 split AC units are free from ozone-depleting CFC (Chlorofluorocarbons)
V	Green Buildings & Certification
1	All existing buildings are registered with Indian Green Building Council (IGBC) for green building certification under IGBC – EB rating
2	New buildings are constructed over the last six years and those under construction are registered with GBCI EDGE and USGBC LEED for green building certification for Gold rating.
3	GBCI-EDGE Green building certification received for New Ladies Hostel & New staff quarters on 23.04.2018.
4	New Crescent School of Architecture block is conceived as a Net Zero Energy building and registered under USGBC-LEED for Gold rating certification.
VI	Transport – Pollution Free Environment
1	To reduce pollution inside campus, 55 Nos bicycles have been provided for students to commute between Men’s Hostel, Ladies Hostel and College Main gate.
2	Retreading of vehicle tires to extend the life of each tier is being implemented with an MOU with TVS Retread.
3	Battery Cars and Electric Bike provided for staff and Eco friendly Load vehicle for Hostel.
4	15 Nos new AC buses, which are BS-IV compliant vehicles, have been provided for induction into the student transport fleet from July 2018.
VII	Carbon Foot Print and Carbon Offsetting
1	38% of Carbon foot print is offset by the above environment – friendly measures in campus and 10% Carbon Offsetting.
VIII	Rain Water Harvesting
	All Buildings
XIV	Green Campus – Tree Plantation

1	Planted Beema bamboo saplings for 5000sft run area throughout our compound to absorb dust, CO2 and to release more oxygen and to create pollution free environment.	
2	Oxy park created opposite to convention Centre by planting Beema bamboo in campus	
3	Trees (More Varieties)	1019 Nos
4	Beema Bamboo Plants	2075 Nos
5	Total No.of tree planted	3094 Nos
XV	Certification & Ranking	
1	QS Star Rating for facilities	5 Star
2	QS I.Gauge Audit for facilities	Diamond
3	All New Buildings	Edge certified
4	UGC Swachhta	5 th Rank
5	AICTE- Smart & Clean Campus Award	Appreciated

Crescent – An Overview



re:think India
**VISIONARY
 EDUPRENEUR
 OF INDIA**
**LATE SRI B.S.
 ABDUR RAHMAN**

Our Founder: (Alhaj. Late. Dr. B. S. Abdur Rahman)

“An uncommon man of deep conviction and perseverance his vision runs Crescent today for the benefit of the teachers, staffs, students, alumni and the society”

- ❖ Established in 1984 as Crescent Engineering College affiliated to the University of Madras and Anna University.
- ❖ It was upgraded and blossomed as B. S. Abdur Rahman Crescent Institute of Science and Technology (Deemed to be University) on its 25th silver jubilee year in 2009.
- ❖ The Institute is located in the state of Tamil Nadu in South India.
- ❖ 50.19 acres campus is based in what it calls "the greenest spot of Chennai", next to Aringnar Anna Zoological Park.
- ❖ Crescent Engineering College started on 12th October 1984 with intake of 180 students and sharing the facilities from existing Crescent School in the same campus.
- ❖ Formally inaugurated by M.A. Chidambaram in the presence of DOTE Director Mr. Sivalingam, Chairman, Seethakathi Trust Mr. K.T.M.S. Abdul Cader (Thaikappa) and Founder B.S. Abdur Rahman.



During Inauguration 12th October 1984

Back up Electrical Supply

GENERATOR / POWER BACKUP

BSA Crescent Institute of Science and Technology has 11 kV HT power supply two numbers of 800 kVA transformer.



11 KV HT POWER SUPPLY / 8 00 KVA TRANSFORMERS

The Institution has on-campus one indoor and outdoor diesel powered generators of 500 kVA and 750 kVA capacity which ensures uninterrupted power supply in the campus. The total set-up in the institution ensures the uninterrupted power supply to the institution for its various functions. Our Institution is having their power back up (generators) unit for enough back up energy around 24x7 for protected loads. The generators turned on and all the protected electric loads seamlessly transferred to the backup power system. Electrical Maintenance department works to ensure that we have access to back up power to continue serving under any condition.



OUTDOOR DIESEL POWERED GENERATOR OF 750 KVA



INDOOR DIESEL POWERED GENERATORS OF 500 KVA

All computer labs in the Campus have backup power systems through UPS, which have adequate stand by time. All computer systems are connected to 80 numbers of “ON LINE” UPS units with total capacity of 800 kVA.



As a part of its ‘Green Campus’ initiative, our Institution has set up a 550 kWp grid tied Rooftop Solar PV Power Plant on its academic buildings. The plant is located in the vacant roof space of various buildings.

The outputs from all the plants are connected to the institute grid through local AC distribution boards. This output can be used anywhere in the campus. Available diesel generator set is being used to create the local grid during load shedding.

If a Solar Power Plant is connected with DG SET and the power consumption of connected Load is lower than the power generated by solar power plant, then the excess of power generated by solar power plant will reverse back to DG SET and this will lead to permanent damage of DG SET. Zero Export device has been installed to limit the surplus amount of solar power that their systems export to the DG SET.



INSTALLED ROOFTOP SOLAR PV POWER PLANT

Installed 550 kWp Rooftop solar plant shares all the power generated with DG set to reduce its dependence on diesel as fuel.

Most recently, a 100 kWp rooftop plant is being installed on New Architecture Block and CIIC Block. This installation shall run in parallel to the existing 550 kWp solar plants.



100 KWP ROOFTOP SOLAR PLANT UNDER CONSTRUCTION

RENEWABLE ENERGY – SOLAR POWER PLANTS

B.S. Abdur Rahman Crescent Institute of Science and Technology undertakes initiatives to obtain energy from various natural resources. The Institute is pioneer in establishing renewable energy sources to meet the energy requirement of the campus.

Three Roof top solar power plants of total capacity of 550 KWp (against the sanctioned demand of 1200 KW) are installed in our campus.



SOLAR PANEL INSTALLED AT ROOF TOP IN VARIOUS BUILDINGS





Google Satellite Map View

150 kWp Solar PV Power Plant - Generation from 2014 -2020			
S.No	Year	Units Generated	Amount saved
1	2014	1,03,248	8,77,615
2	2015	2,14,937	18,26,969
3	2016	2,05,374	18,42,140
4	2017	1,93,912	16,57,963
5	2018	1,98,162	17,12,369
6	2019	1,96,269	16,83,398
7	2020	1,16,665	12,00,245
	Total	12,28,567	1,08,00,699

100 kWp Solar PV Power Plant - Generation from 2014 -2020			
S.No	Year	Units Generated	Amount saved
1	2014	17,458	1,48,398
2	2015	1,46,940	12,48,990
3	2016	1,50,730	13,56,665
4	2017	1,41,458	12,08,720
5	2018	1,50,464	13,00,737
6	2019	1,42,965	12,26,905
7	2020	83,817	8,60,917
	Total	8,33,832	73,51,332

300kWp Solar PV Power Plant - Generation from 2018-2020		
Month/Year	Units Generated	Amount Saved INR
Nov'18	17,917	1,54,624
Dec'18	23,120	2,19,871
Jan'19	36,701	3,47,925
Feb'19	39,658	3,36,696
March'19	41,408	3,49,069
April'19	46,812	3,80,113
May'19	39,642	3,25,857
June'19	32,963	3,04,908
July'19	29823	2,65,723
Aug'19	32538	2,72,668
Sept'19	33900	2,78,319
Oct'19	31291	2,61,280
Nov'19	29025	2,40,037
Dec'19	25548	232486.8
Jan'20	31938	283928.82
Feb'20	35155	298114.4
March'20	32113	277456.32
April'20	23722	295101.68
May'20	20746	238786.46
June'20	20164	248420.48
July'20	18071	170770.95
Total	6,42,255	57,82,158

Total Solar Power Generation - 550kWp up to 31st July 2020		
Plant	Units	Amount
150Kwp	12,28,567	1,08,00,699
100kWp	8,33,832	73,51,332
300kWp	6,42,255	57,82,158
Total	27,04,654	2,39,34,189

The number of units generated through solar power plants constitute **41%** of total electricity consumption since June 2014.

RENEWABLE ENERGY – SOLAR WATER HEATERS

Installed total capacity of 36,500 liters. This is equivalent to 365 Nos electric geysers of 2kW capacities. The power saving is estimated to be around 24 Lacs per annum.



Men's Hostel



Ladies Hostel



New Staff Quarters

Men's Hostel		
Block	No. of tanks	Capacity in liters
A Block	20	5000
B Block	6	3000
C Block	6	3000
D Block	8	4000
Main block	20	5000
PG block	12	3000
Ladies Hostel		
Main block	10	5000
Annexure Block		
New Block Phase 1	11	2750
Staff Quarters		
New Staff Quarters	23	5750
Total Capacity	116	36,500Litres

RENEWABLE ENERGY – SOLAR STREET LIGHT

Installed towards staff quarters to Men's hostel road and Architecture block area. This project was done by our III yr. EEE students along with our Estate electrical dept. team.



Near Sports Village Road



Near Architecture Block

WASTE MANAGEMENT PRACTICES

- ❖ B.S. Abdur Rahman Crescent Institute of Science and Technology takes initiatives to manage the different types of waste generated in the campus. The waste management includes
- ❖ Solid waste management
- ❖ Liquid waste management
- ❖ E-waste management

SOLID WASTE MANAGEMENT

- ❖ B.S. Abdur Rahman Crescent Institute of Science and Technology is committed to ensure that the built infrastructure of the institute has sustainability as a core principle in maintenance management of the campus.
- ❖ Estate office aspires to follow a range of sustainable design features and practices implemented to build and maintain the institute as a complete green and sustainable campus continuously.
- ❖ The solid waste management is practiced to safely dispose the waste generated at the campus by way of segregating the waste as organic waste, recyclable waste and inert waste and processing the waste thus segregated.
- ❖ Implementation of solid waste management inside the campus is outsourced to GREEN SERVICES TRUST and an average of Rs. 24.0 lakhs per annum is spend towards salary for the staffs.
- ❖ Every year our institute contributes waste papers towards national recycling initiative organized by ITC Ltd (paper boards & specialty paper division) which is equivalent to saving 750 trees on an average.
- ❖ Our Institute received certificate of Appreciation from Green Services Trust for partnering in implementing solid waste management project in the campus in an environment friendly manner and diverted 1,44,655 Kg of waste from landfill to recycling during the year 2017-2018.

WASTE QUANTIFICATION DATA – FROM 2016 TO 2020:

- ❖ Total Waste Collected: 10,34,971 Kgs.
- ❖ Total Organic waste: 4,53,949 Kgs.
- ❖ Total Recyclable waste: 2,15,496 Kgs.
- ❖ Total Inert waste: 3,65,524 Kgs.

ACTIVITIES CARRIED OUT

- ❖ Two bins system is followed for waste collection one for organic and one for recyclables.
- ❖ Collection of waste from the campus is done through a tractor and with the support of six-man power.
- ❖ The collected segregated waste will be unloaded at the waste processing yard and processed through 15 staff called as 'Green friends'.
- ❖ The waste generated at the campus will be processing as per SWM Rules 2016
- ❖ Bio-degradable waste is composted under windrow composing method.
- ❖ Recyclable waste is further segregated and disposed through vendors on need basis.
- ❖ Sanitary napkins waste is safely disposed using an incinerator fitted with wet scrubber for pollution control
- ❖ Food waste is fed in the bio gas plant and the gas is utilized for cooking purpose in the canteen
- ❖ E-waste and hazardous waste is handed over to the authorized processors and certificate of destruction as per norms is obtained from the processor.
- ❖ 15 Green Friends (persons engaged for waste processing) engaged to carry out above mentioned work. 2 Supervisory staff also been engaged for coordination and awareness creation activity at the campus and 6 green friends are engaged for waste collection and maintenance of bio gas plant.
- ❖ Different types of Solid waste management Training and Awareness program conducted to college students, staff, Housekeeping workers, security and green friends.
- ❖ The harvested bio compost will be given to the estate office every month, nearly 2000kgs, for garden use
- ❖ Every month around 4000kg of recyclable waste is removed from waste yard for process.

LIQUID WASTE MANAGEMENT

- ❖ The University takes sufficient measures to treat the wastewater generated within the premises and it ensures that the treated water is reused within the campus. Estate office has established suitable and sustainable sewage treatment plants with the design features to completely treat the wastewater generated in the university.
- ❖ 2 nos. of Sewage treatment plants of 250KLD capacity are available, one for Men's Hostel and one for Institute campus.
- ❖ The sewage generated in the University is generally characterized by the presence of organic, inorganic and suspended solids.
- ❖ The chain of treatment is aimed to remove such pollutants from the wastewater so that it can be effectively reused.

- ❖ The treatment system consists of preliminary treatment system followed by the primary and secondary treatment process.
- ❖ The preliminary treatment system aims the removal of floating bodies and grits from the waste water. Bar Screens are used in the treatment plant to remove materials like plastics and other floating objects.
- ❖ The grit chambers are used to remove sand and silts from the wastewater.
- ❖ The primary sedimentation tank helps in the removal of the suspended solids.
- ❖ The biological treatment system is the secondary treatment process used in the removal of organics from the wastewater
- ❖ The suspended solids are removed using the primary sedimentation tank and after this the wastewater is subjected to biological treatment to remove the organic content from the waste.
- ❖ The secondary treatment process is incorporated with ECO-BIO BLOCK so as to increase the efficiency of the treatment system.
- ❖ The Eco-Bio Bricks helps in the attachment of bacteria in the treatment system and helps in the better removal of organic content from the wastewater.
- ❖ This attached system will also help the treatment system to handle shock loadings if there is an increase in the organic loading rate in the biological treatment system.
- ❖ The sewage treatment plant is working on the principle of attached growth aerobic system (Eco-Bio Block) followed by sand filter and carbon filter.
- ❖ The carbon and sand filter ensures that any amount of organics that is left in the wastewater is suitably adsorbed from the wastewater and it is stored in the collection tank.
- ❖ The entire Sewage Treatment Plant is periodically subjected to maintenance regularly.
- ❖ The working of all the pumps and valves are checked periodically to ensure the smooth functioning of the sewage treatment plant.
- ❖ The treated water is used for landscaping and toilet flushing purpose.
- ❖ This helps the university to reduce its dependency of fresh water from wells for gardening.
- ❖ The physical, chemical and biological characteristics of the treated water are tested to ensure the efficiency of the treatment systems.
- ❖ Some of the important parameters checked include pH, solids, Chemical oxygen demand, Biochemical oxygen demand, Nitrates, chlorides etc.
- ❖ The treated wastewater is checked periodically to ensure its quality so that it can be effectively reused for gardening and as well for the toilet flushing.

E-WASTE MANAGEMENT

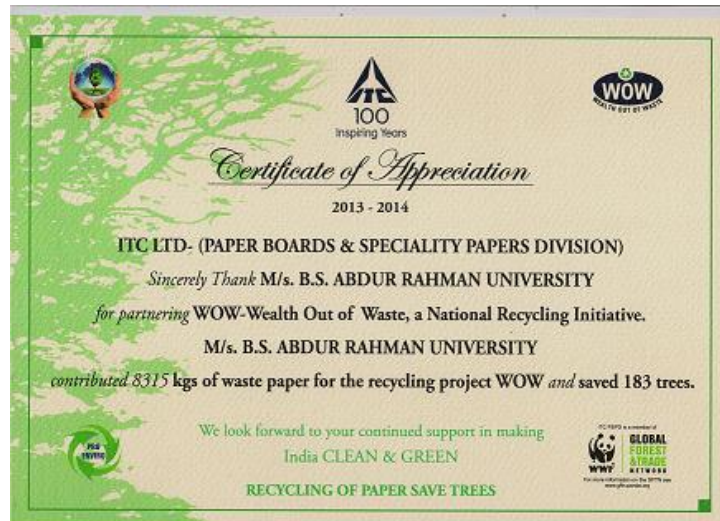
- ❖ The institute takes sufficient measures to dispose the e-waste generated inside the campus properly.
- ❖ Our Institute also takes initiatives to reduce the generation of e-waste in the campus

- ❖ All obsolete electrical and electronic waste is disposed as e-waste to vendors for proper destruction without damaging the environment and certificate for such destruction and disposal are obtained.
- ❖ Electronic waste that are disposed includes
- ❖ Old TVs, computer monitors, printers, scanners, keyboards, mouse, Radio, Phones, Fax, Photocopy machines, cables from computer laboratories of various departments
- ❖ Flip flops, memory chips, motherboard, compact discs, cartridges
- ❖ Kitchen equipment from staff quarters and hostels like toasters, coffee makers, microwave ovens etc.
- ❖ Laboratory equipment's from various departments.
- ❖ Totally 2330kg E –waste generated is destructed every year.
- ❖ The condemned electronic equipment's are handed over to the estate office on a regular basis by the departments after checking or inspection by a committee consisting of Senior Professors. Once the equipment's are certified as obsolete or non-working it is condemned and handed to estate office.
- ❖ This E waste which is collected is then disposed to vendors.
- ❖ It is also ensured that the generated E wastes are not disposed along with the other solid waste generated in the campus.
- ❖ Collection of e waste separately is a sustainable approach to prevent such waste reaching the landfills and also provides an opportunity to recycle such waste.
- ❖ The e waste collected separately is handed over to the vendors for recycling or disposal.
- ❖ The company GEMS recycling PVT Limited, Neervallur Village, Kanchipuram district, Tamilnadu collects all the waste.
- ❖ Our institute has received certificate for destruction and disposal of waste from the company for reprocessing/recycling the waste without harming the environment in an ecofriendly manner.
- ❖ A Standard Operating Procedure has been evolved for handling the waste disposal system.
- ❖ Awareness is also created among faculty, students and also office bearers on the usage of electronic goods, its usage and also on the ways that it has to be collected and disposed
- ❖ Electronic goods are put to optimum use; the minor repairs are set right by the supporting staff and the Laboratory non-teaching faculty and the major repairs, by the professional technicians, and are reused.
- ❖ The damaged computers are used by the instructors in the practical sessions. Finally, they are exchanged with the local dealers.
- ❖ UPS Batteries are recharged / repaired / exchanged by the suppliers.
- ❖ The waste compact discs are reused by civil engineering/architecture students for decoration/participation in competitions.

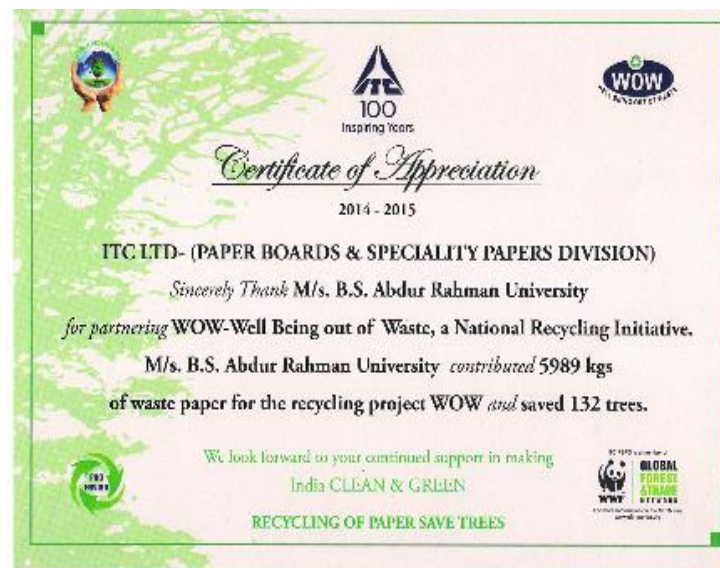
- ❖ Steel, Iron, Aluminum, and Wood from construction site will be sent to scrap shop and further to recycling plants.
- ❖ Steel, Iron, Aluminum, from laboratories will be sent to scrap shop and further to recycling plants.
- ❖ All the communication of the institute is through Internet within the teaching and nonteaching faculty members.
- ❖ There are hardly any floppies or CDs used for day to day operations.

DOCUMENTAL EVIDENCES FOR SOLID WASTE MANAGEMENT

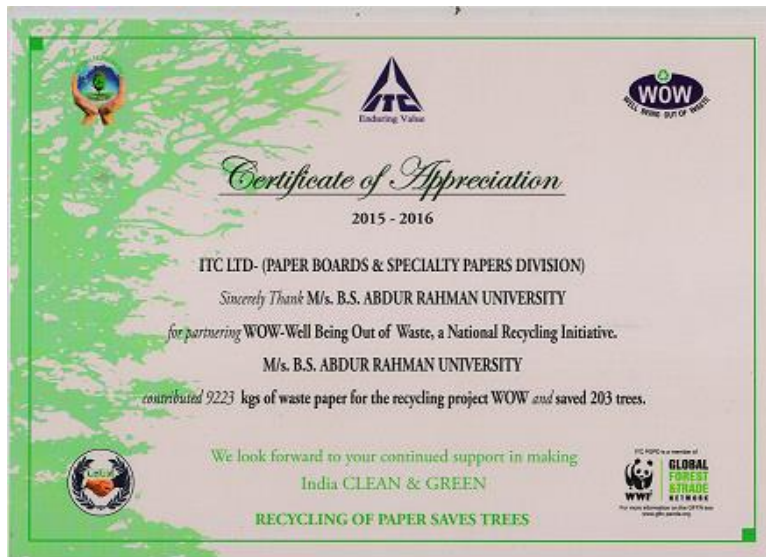
The solid waste management project is intended to safely dispose the waste generated at the campus by way of segregating the waste as organic waste, recyclable waste and inert waste and processing the waste thus segregated.



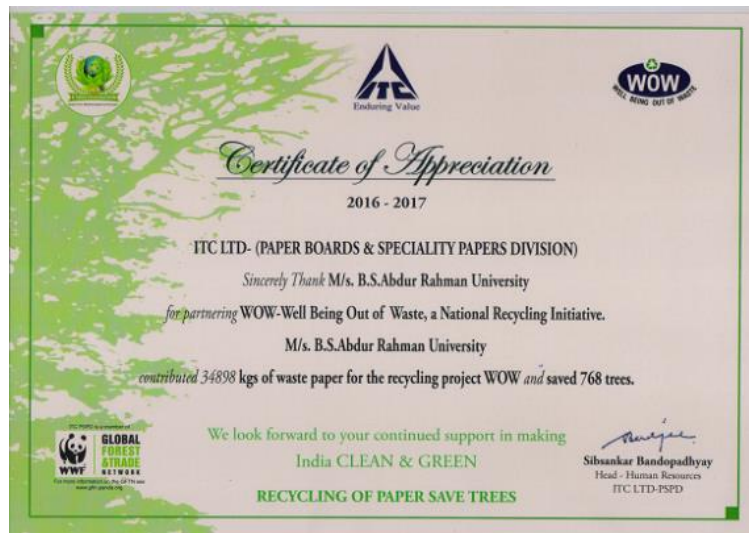
Certificate of Appreciation for Recycling Paper Waste (2013-2014)



Certificate of Appreciation for Recycling Paper Waste (2014-2015)



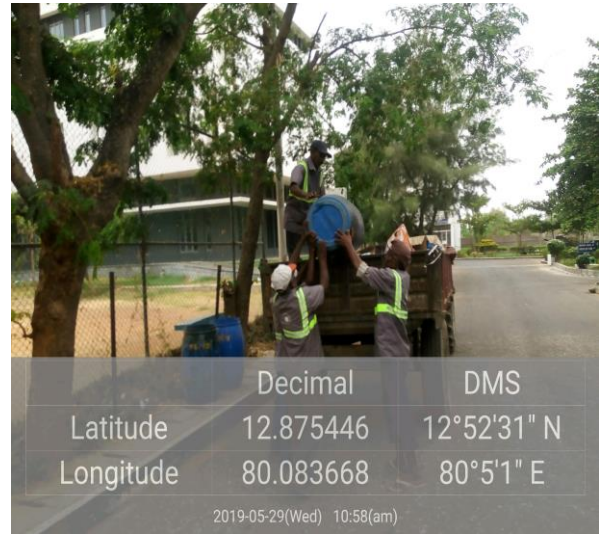
Certificate of Appreciation for Recycling Paper Waste (2015-2016)



Certificate of Appreciation for Recycling Paper Waste (2016-2017)



Certificate of Appreciation for Implementing Solid Waste Management Project (2017-2018)



Collection of Solid Waste



Segregation of Solid Waste



Recovery of Recyclable Waste



Windrow Formation and Rotation



Training and Awareness Program for Housekeepers and Green Friends

WASTE COLLECTION DATA FROM 2016 TO 2020

S.No	Month	Organic waste in Kg	Recycle waste Kg	Inert waste Kg	Total Waste in Kg
1	Jan'16	5,977	1949	13429	21,355
2	Feb'16	5,635	1983	12700	20,318
3	March'16	5,800	2507	13736	22,043
4	April'16	5,477	2775	12898	21,150
5	May'16	4,544	2410	11457	18,411
6	June'16	5,252	2747	13150	21,149
7	July'16	3,676	3124	12409	19,209
8	Aug'16	5,330	4374	9217	18,921
9	Sep'16	4,917	2861	1830	9,608
10	Oct'16	7,956	3412	1225	12,593
11	Nov'16	10,966	4525	1025	16,516
12	Dec'16	8,394	2283	794	11,471
13	Jan'17	10,107	3043	909	14,059
14	Feb'17	10,426	3174	881	14,481
15	March'17	11,788	3980	1077	16,845
16	April'17	11,819	4423	1230	17,472
17	May'17	2,710	5608	3970	12,288
18	June'17	711	5305	591	6,607
19	July'17	885	4828	790	6,503
20	Aug'17	1,187	4477	708	6,372
21	Sept'17	1,393	5046	633	7,072
22	Oct'17	9,096	4252	689	14,037
23	Nov'17	10,677	4751	947	16,375
24	Dec'17	11,446	5958	1084	18,488
25	Jan'18	17,653	7280	1215	26,148
26	Feb'18	13,529	7529	1721	22,779
27	Mar'18	11,648	8716	1496	21,860
28	April'18	10,782	7588	1537	19,907
29	May'18	5,912	7112	1794	14,818
30	June'18	5,643	6914	1801	14,358
31	July'18	10,997	6292	1892	19,181
32	Aug'18	9,880	5083	1696	16,659

33	Sept'18	9,610	5389	1580	16,579
34	Oct'18	9,910	5622	1705	17,237
35	Nov'18	9,325	5995	1521	16,841
36	Dec'18	9,726	4578	1620	15,924
37	Jan'19	9,524	5092	1684	16,300
38	Feb'19	10,142	5554	1507	17,203
39	March'19	10,122	5865	1715	17,702
40	April'19	-	-	-	-
41	May'19	1,630	7465	3015	12,110
42	June'19	2,260	5165	2675	10,100
43	July'19	9,135	2970	6500	18,605
44	Aug'19	9,730	2583	7100	19,413
45	Sept'19	13,260	1785	10850	25,895
46	Oct'19	12,600	1180	11350	25,130
47	Nove'19	17,100	1688	15450	34,238
48	Dec'19	15,600	1390	15700	32,690
49	Jan'20	21,900	2155	19800	43,855
50	Feb'20	23,900	2390	26700	52,990
51	March'20	14,950	1440	19100	35,490
52	April'20	-	-	-	-
53	May'20	390	86	7200	7,676
54	June'20	627	300	22700	23,627
55	July '20	295	495	55523	56,313

SOLID WASTE MANAGEMENT - ECOBIN (250 KGS / DAY)



250Kg Ecobin in BSACIST for the management of food Waste

Operating Procedures

Food waste after segregate loaded and mixed with 10-15% of saw dust +0.1% Bioculum. Now the mixture lifted into feeding port of Ecobin. In the tank, mixing operation will be done with regular time intervals in a day by day using main agitator derive.

Air will pass through into the tank by using blower with regular time intervals. Repeating mixture operation for feeding 250kgs per day. After repeating the activities for 15 days' compost developed at the bottom.

Around 30,735kgs of collected compost collected till July 2020 and used for fertilizing the soil by toping up in the soil.



ECO-BIN

SOLID WASTE MANAGEMENT - GARBAGE INCINERATOR

- ❖ Garbage Incinerator machine installed in our campus/solid waste management yard with 50kg/hr. capacity reducing waste product to inert ash.
- ❖ Daily generation 500kg/day and generated fly ash being used as manure.
- ❖ Incinerated item will be less than 10% of their original bulk when reduced to ash
- ❖ Use for incinerator of waste paper, tea cup, Dry garbage and kitchen dry waste.
- ❖ Transport cost from point of work generation to disposal site are dramatically reduced.
- ❖ Around 12,815Kg generated till July 2020 as an alternate solution to landfill.



SOLID WASTE MANAGEMENT - SANITARY INCINERATOR



- ❖ Incinerator machine has been installed to dispose sanitary napkins.
- ❖ Separate bins are provided in all ladies' toilets in university and in Ladies Hostel to separate the napkins from other waste.
- ❖ Wet scrubber is attached at the outlet of burner where the fumes gets scrubbed in water and gets filtered to remove the harmful emissions. Separate Napkin destroyer machine has installed in Ladies hostel 5 Nos and 1 in Medical Hall.

SOLID WASTE MANAGEMENT - BIO-GAS PLANT

A Biogas plant of 50 m³ capacity for Ladies Hostel was commissioned in June 2017. The gas generated from the plant is utilized for cooking in Ladies Hostel Mess Kitchen.



Biogas Plant



Food waste feed in to Bio Gas Plant

BIO GAS GENERATION FOR THE PERIOD OF 2017 - 2020			
Month	Total Gas consumed(cum)	Equivalent to LPG (KG)	Cost Saved (Rs)
Sep'17	94	42	2,601.00
Oct'17	180	81	5,280.00
Nov'17	366	164.7	12,062.00
Dec'17	277	124.65	9,178.00
Jan'18	170	76.5	5,594.57
Feb'18	153	68.85	5,016.00
Mar'18	186	83.7	5,756.00
April'18	195	87.75	5,839.00
May'18	138	62.1	4,105.00
June'18	11.03	4.96	327.82
Aug'18	110.814	49.86	3,296.42

Sept'18	55.56	25	1,993.58
Oct'18	51.196	23.03	1,941.79
Nov'18	49.905	22.45	2,006.32
Dec'18	17.099	7.69	608.72
Jan'19	180	81	5,280.00
Feb'19	366	164.7	12,062.00
Mar'19	153	68.5	5,016.00
Apr'19	360	162	10,560.00
May'19	178	80.1	5,510.00
Jun'19	94	42	2,601.00
July'19	192	86.4	5,679.00
Aug'19	274	123.3	7,289.00
Sept'19	186	83.7	5,170.00
Oct'19	330	148.5	9,371.13
Nov'19	190	85.5	5,935.50
Dec'19	112	50.4	3,535.95
Jan'20	92	41.4	2,139.00
Feb'20	80	36	2,232.00
March'20	56	25.2	1,465.00
Total	4897.604	2202.94	149451.8

BIOBOX

Our Institute has established BIO BOX unit of 50Kg/day capacity in association with M/S.Kankyo Group of Companies to generate biogas from various organic solid waste.



BIOBOX- Biogas generation unit



Pyrolysis unit

PYRO-CRACKER

Our Institute has established Pyro- Cracker unit of 25 Kg / Batch capacity in association with M/S.Kanyo Group of Companies for thermal pyrolytic degradation of plastic, biomass and mixed garbage.

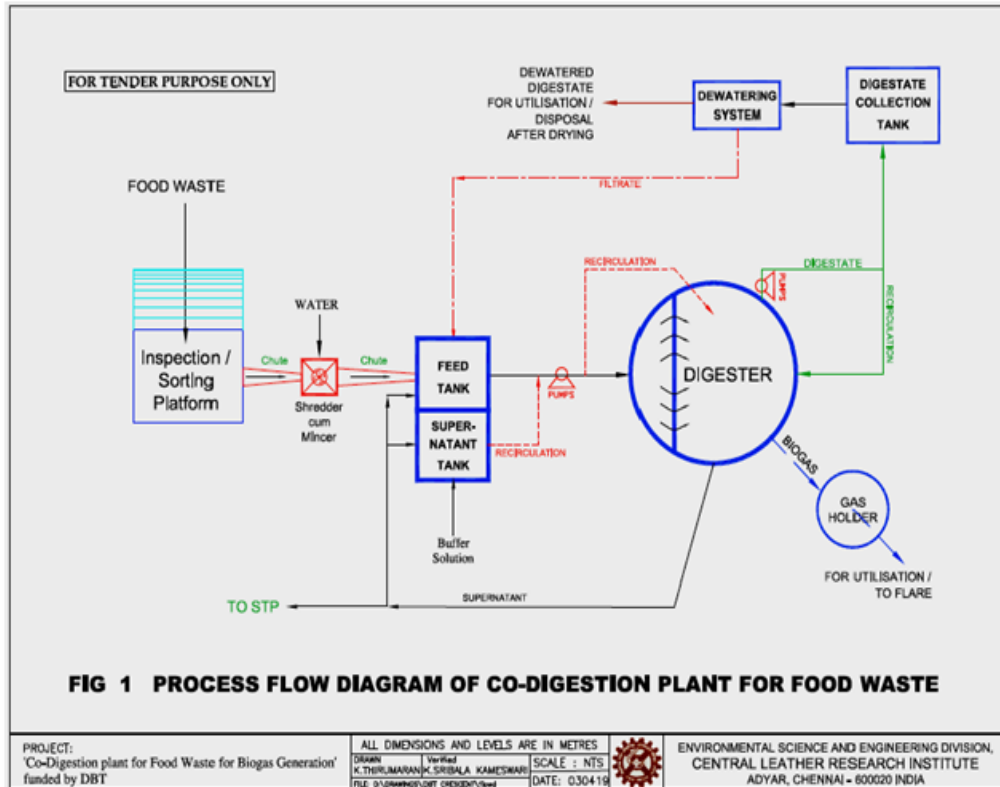
CSIR - CLRI SPONSORED PROJECT – BIOGAS PLANT 500 KGS/DAY (ON GOING)

Establishment of new Biogas plant 500kg/day at Men's Hostel



Erection & Commissioning stage

- ❖ Biogas Plant 500 kgs/day from CSIR-CLRI, Govt. of India, Chennai funded by DST New Delhi in collaboration with KANKYO Technologies.
- ❖ To handle the food waste generated from hostel kitchens and canteens
- ❖ It will generate 15-20 m³/day gas from the plant and the same will be utilized for our cooking needs at Hostel kitchens and Canteens.
- ❖ The total cost of project is 35 lakhs. (Crescent Contributed 10 lakh).



Process flow Diagram



Final view

LIQUID WASTE MANAGEMENT - SEWAGE TREATMENT PLANT – 500KLD

- ❖ 2 nos. of Sewage treatment plants of 250KLD capacity are available, one for Men’s Hostel and one for Institute campus. The STP is of Eco-Bio Block type. The treated water is used for landscaping and toilet flushing purpose.
- ❖ The sewage treatment plant is working on the principle of attached growth aerobic system (Eco-Bio bricks) followed by sand filter and carbon filter. The treated water is having a COD about 100 mg/L and BOD about 16 mg/L.



DETAILS OF SEWAGE TREATMENT PLANTS

Location	Capacity	Remarks
College campus	250KLD	Commissioned in 2003 as a 150KLD plant. Revamped and capacity increased to 250KLD in 2015
Men’s Hostel	250KLD	Commissioned in 2014

DETAILS OF WASTEWATER GENERATION

S.No	Location	Total water collected	Water recycled	% of water reutilized
1	College campus	250 KL	220KL	90
2	Men's Hostel	250 KL	220KL	90

RECYCLED WATER DETAIL 2016-2020

S.No	Month/ year	No of Loads	Total Qty in Liters	Quantity of treated water in Ltrs
1	Nov'16	1709	17090000	12170000
2	Dec'16	1467	14670000	10576000
3	Jan'17	1269	12690000	10506800
4	Feb'17	1501	15010000	12429000
5	March'17	1765	17650000	13586000
6	April'17	1531	15310000	12124000
7	May'17	1539	15390000	12663000
8	June'17	1105	11050000	7745000
9	July'17	1278	12780000	7249000
10	Aug'17	1756	17560000	13668000
11	Sept'17	1608	16080000	13461000
12	Oct'17	1676	16760000	14585000
13	Nov. 2017	1318	1,31,80,000	1,35,86,000
14	Dec. 2017	1294	1,29,40,000	1,36,68,000
15	Jan. 2018	1213	1,21,30,000	1,11,60,000
16	Feb. 2018	1209	1,20,90,000	1,17,80,000
17	Mar. 2018	1281	1,28,10,000	1,20,90,000
18	Apl. 2018	1236	1,23,60,000	1,24,00,000
19	May. 2018	1301	1,30,10,000	1,34,61,000
20	June. 2018	954	95,40,000	81,24,000
21	July. 2018	1334	1,33,40,000	1,13,15,000
22	Aug. 2018	1327	1,32,70,000	1,16,25,000
23	Sep. 2018	1288	1,28,80,000	1,20,90,000
24	Oct. 2018	1427	1,42,70,000	1,10,05,000
25	Nov. 2018	1294	1,29,40,000	1,08,50,000
26	Dec. 2018	1026	1,02,60,000	9,54,000
27	Jan. 2019	1169	1,16,90,000	1,07,80,000
28	Feb. 2019	1527	1,52,70,000	1,19,35,000
29	Mar. 2019	1709	1,70,90,000	1,20,90,000
30	Apl. 2019	1374	1,37,40,000	1,21,52,000
31	May. 2019	1448	1,44,80,000	1,21,83,000
32	June. 2019	873	87,30,000	82,20,000
33	July. 2019	1305	1,30,50,000	1,00,75,000
34	Aug. 2019	1158	1,15,80,000	1,11,91,000
35	Sep. 2019	1360	1,36,00,000	1,12,84,000
36	Oct. 2019	1262	1,26,20,000	1,13,46,000
37	Nov. 2019	1233	1,23,30,000	1,15,94,000
38	Dec. 2019	963	96,30,000	76,56,000
39	Jan. 2020	1028	1,02,80,000	1,12,53,000
40	Feb. 2020	1403	1,40,30,000	1,14,39,000
41	Mar. 2020	1194	1,19,40,000	1,16,56,000
42	Apl. 2020	479	47,90,000	49,35,000
43	May. 2020	589	58,90,000	54,31,000
44	June. 2020	561	56,10,000	45,55,000
45	July. 2020	408	40,80,000	4,45,000
46	Aug. 2020	471	47,10,000	4,49,000

MIRA CARBON SEWAGE TREATMENT PLANT

Our Institute has established MIRA CARBON SEWAGE TREATMENT PLANT of 2 m³ capacity in association with M/S.Kanyo Group of Companies to treat domestic wastewater generated from the Institute.

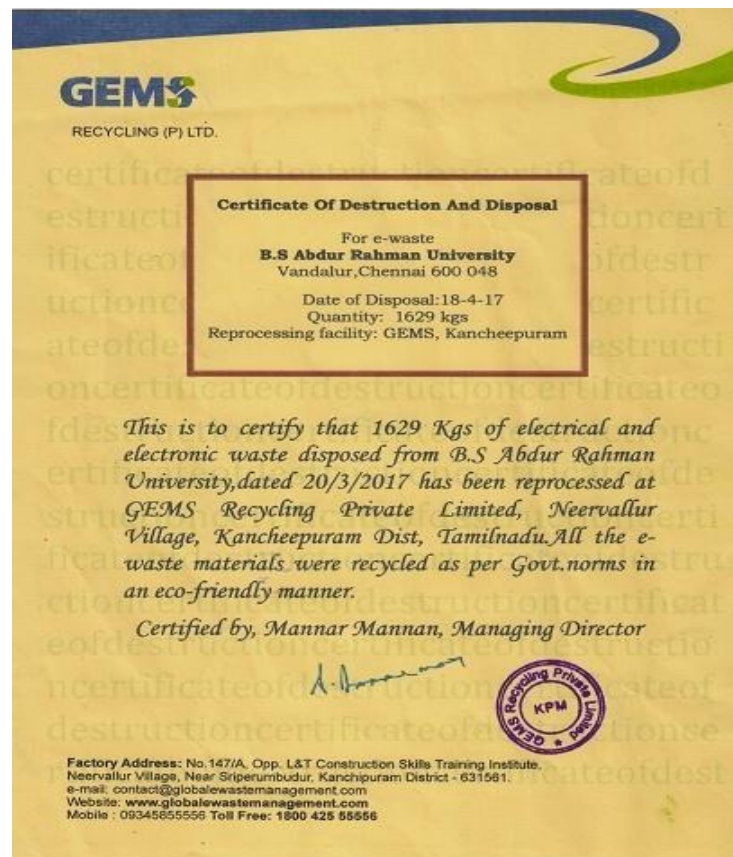


Latitude: 12.872726
 Longitude: 80.085782
 Accuracy: 27.7m
 Time: 09-08-2019 14:17
 Note: Mira carbon stp1

Mira carbon sewage treatment plant

E-WASTE MANAGEMENT

All obsolete electrical and electronic waste is disposed as e-waste to vendors for proper destruction without damaging the environment and certificate for such destruction and disposal are obtained. Totally 2330kg E –waste destructed in the year 2017.



CERTIFICATE FOR DESTRUCTION OF E WASTE

Your Trust is Our Success.



www.virogreen.in

62
 10/11/17

Certificate of Destruction

COD No: VGIN170336
 CPCB REG No: B-29016(1881)/1(Reg) 10/HWMD

Company Name: M/s. BS Abdur Rahman Crescent Institute
 Of Science & Technology,
 Company Address: Seethakathi Estate,
 Vandalur, Chennai.
 Company Ref: GP No: 6493
 Date Collected: 14/12/2017
 Date Received: 14/12/2017
 GRN No: VGIN-0555
 Date of Destruction: 28/12/2017

This document certifies that all the below mentioned items were received and processed in an environmentally responsible manner by **Virogreen India Private Limited**, Chennai

This further certifies that the items identified below had been properly disposed in an environmentally responsible manner, utilizing the process and equipment available in accordance with the Company procedures or written instructions where applicable. This "Certificate Of Destruction" is issued based on a series of specific activities; including collection, identification, separation and treatment by mechanical process or manual means, whereby material elements are destructed from the "ITEMS" for use in the form of raw materials and is deemed no longer fit for original intended purpose, and recycled wherever possible.

Index	Description	Qty Kgs
1	E-Waste Scrap	701




Person Incharge: A. Mariapona
 Designation: Warehouse Manager
 Date: 28/12/2017

Factory : S/No.297/1B-2, No.49, Pappankuppam Village, S.R.Kandigal Road, Gummidipoondi - 601 201
 Thiruvallur Dist, Tamil Nadu, India. (CIN No: U52392TN2002PTC049211) Phone: +91 - 44-65485915.
 Fax: +91-44-2651-2449. Mob: +91 99408 31313.
 Email: reachus@virogreen.in

Your Trust is Our Success.



www.virogreen.in

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Index	Description	Qty Kgs
1	L-Waste Scrap	701





Person Incharge: A. Mariapona
 Designation: Warehouse Manager
 Date: 28/12/2017

Factory : S/No.297/1B-2, No.49, Pappankuppam Village, S.R.Kandigal Road, Gummidipoondi - 601 201
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 Fax: +91-44-2651-2449. Mob: +91 99408 31313.
 Email: reachus@virogreen.in

CERTIFICATE FOR DESTRUCTION OF E WASTE

BIO-WASTE MANAGEMENT

All biological waste generated from Life Science Department and Medical Centre is disposed as bio-waste to vendors for proper destruction without damaging the environment and certificate for such destruction and disposal are obtained.

 **GJ Multiclave (India) Pvt. Ltd.**
(Biomedical Waste Management & Handling Service)

TO WHOM SO EVER IT MAY CONCERN


Destruction Certificate

Date: 19.05.2017

This is to certify that we have destroyed (incineration & treated ETP) the Bio Medical waste /Discarded/Contaminated & Expired Medicine collected from BS ABDUR RAHMAN CRESCENT UNIVERSITY ESRD, U/S OF THE UGC ACT, 1956, GST Road, Vandalur, Chennai - 600 048, Received on 16.05.2017 at our site - No. 245, Thenmelpakkam Village, Chengalpet Taluk, Kancheepuram District, T.N. as per TNPCB norms.

Total Quantity destroyed is 40.500kgs.

For G.J MULTICLAVE (INDIA) PVT.LTD

Authorized Signature 

Regd. Office : New No. 37, Old No. 20, Teachers Colony, Kamarajar Avenue, Adyar, Chennai - 600 020.
Ph : 044-2445 1683. Email : chennalctf@hotmail.com
Website : www.gjmulticlave.com

CERTIFICATE FOR DESTRUCTION OF BIO MEDICAL WASTE

POTABLE WATER SUPPLY

BSA Crescent Institute of Science and Technology has Reverse Osmosis (RO) Plant to provide drinking water to the college and hostel. The entire college campus is facilitated with pure Reverse Osmosis (RO) drinking water with water coolers in every block to cater to the need of pure and safe drinking water to all. We have 44,500 liters / day RO systems installed in the campus and water dispensers are available in each floor in every building. Our water treatment plants provide safe drinking water at every tap on the campus. A high level of maintenance attention and regular testing ensure the quality of the water. Water treatment plant with reverse osmosis technology is available to provide quality drinking water.

RO DRINKING WATER PLANTS

S.No	Location	Capacity Liters/Hr	Working Hours Per day	Qty. of Treated Water in liters
1	University Main Plant-Near to Main block	1500	6	9000
2	Science Block Terrace	1000	5	5000
3	Ladies Hostel New block Terrace	500	5	2500
4	Men's Hostel Dining Hall	2000	4	8000
5	Men's Hostel Service block	2000	5	10000
6	Aeronautical Block terrace	500	2	1000
7	Life Sciences block terrace	500	2	1000
8	New architecture terrace	2000	4	8000
Total treated Water		10000		44500



KBA MEN'S HOSTEL RO PLANT



TBAK LADIES HOSTEL NEW BLOCK TERRACE RO PLANT



AERONAUTICAL BLOCK RO PLANT



ARCHITECTURE BLOCK RO PLANT



WATER DISPENSER / COOLER

WATER TREATMENT PLANT

PROTECTED WATER SUPPLY

Water Treatment plants are provided - 5 Nos. at various places in the campus to treat the water before use in toilets, quarters, Men's Hostel & Ladies hostel.

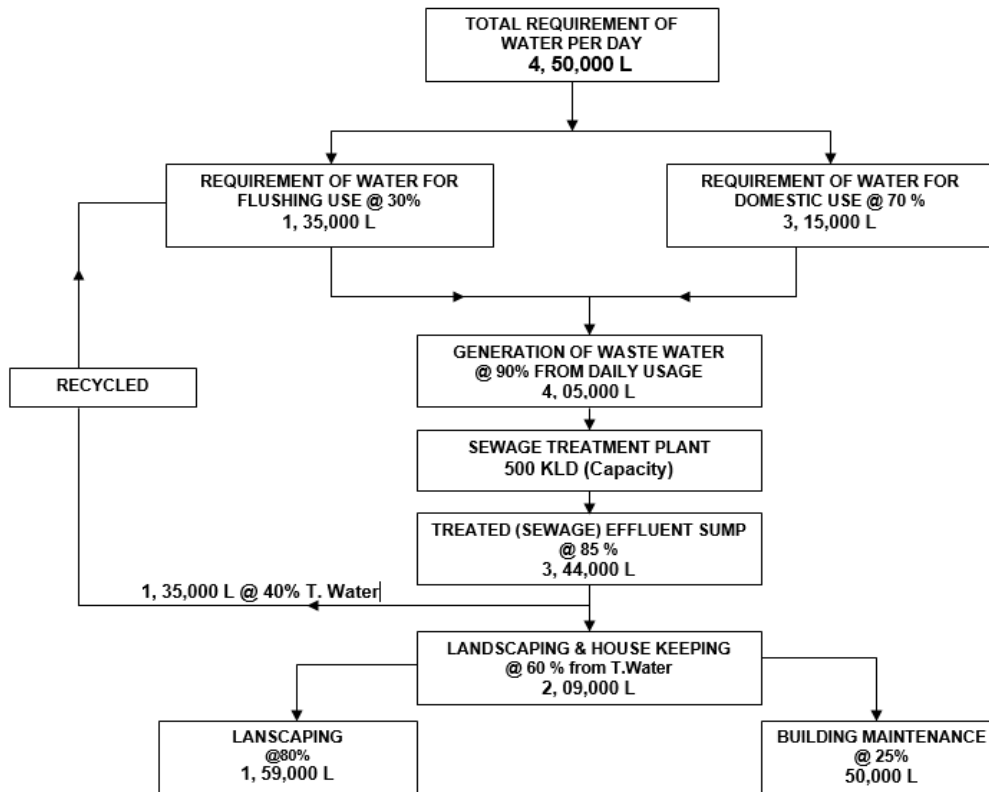
The capacity and quantity of water treated by each plant is tabled below.

S.NO	LOCATION	CAPACITY	WORKING HOURS	REMARKS
1	New staff Quarters	5m ³ /hr	10	Commissioned in Apr -2016
2	New ladies hostel	5m ³ /hr	12	Commissioned in Aug -2016
3	Men's hostel service block	10m ³ /hr	18	Commissioned in Aug -2016
4	VC Villa	1m ³ /hr	4	Commissioned in Jan -2017
5	Life Science block	5m ³ /hr	8	Commissioned in Aug -2017
Total Treated Water		3,35,000 Liters per day		



WATER TREATMENT PLANT

Water Balance Chart



sl. No	Water Consumption / Day	Occupancy in Nos	consumption/day in liters
	Occupants		
1	College Student day scholars 45 lit/day @ 70% usage	3700	116550
2	Ladies Hostel 125 lit/day	470	58750
3	Men's Hostel 125 lit/day	1400	175000
4	Miscellaneous (1)College/ staff 45 lit/day	400	18000
	(2)Estate office staff 30lit/day	350	10500
	(3) General workers	280	8400
	(4) Kitchen and canteen	50	10000
5	Quarters 125lit/day	400	50000
		7050	447200
6	Floating @ 5%	7403	10575
	Total water consumption/day in liters		4,57,775
	Avg water consumption per capita/day		62

RAIN WATER HARVESTING

- ❖ B.S Abdur Rahman Crescent Institute of science and technology is one of the pioneers in implementing solutions to save water.
- ❖ The institute has implemented rain water harvesting system in the campus with a strong desire to utilize the rain water at maximum extent.
- ❖ The Institute has taken tremendous efforts to reduce the water consumption and also to treat the wastewater generated within the campus so that it can be effectively reused for gardening and toilet flushing.
- ❖ In the forefront to save water, our institute of science and technology has initiated and executed the rainwater harvesting in the campus.
- ❖ Rainwater harvesting facility is done in all blocks to collect rainwater from the roof of all buildings.
- ❖ The harvested water is diverted to open wells in institute campus, Men's Hostel and ladies hostel.
- ❖ The placement of rainwater facility within the campus is decided upon by considering the profile of the land so as to drain the maximum amount of water collected with ease.
- ❖ In the buildings, sufficient plumbing connections are provided to trap the rain water from the roof tops.
- ❖ Underground connections are ensured to connect the collected water from the roof top to the rainwater recharge pit.
- ❖ It was also ensured that the rainwater harvesting structures are constructed as per the norms. The recharge pit provided to collect the rain water is series of filter bed.
- ❖ This initiative took shape when the institute faced shortage of water during summer. Cost of buying water was becoming a financial burden. The only alternative to the water crisis was to use the available water more effectively.
- ❖ The features of the recharge pit are described below.

- ❖ A mesh is provided at the inlets of rain water pipes so that solid waste/debris is prevented
- B.S.Abdur Rahman Crescent Institute of Science and Technology has taken initiatives to install rain water harvesting pits in the campus from entering the pit system.
- ❖ The recharge pits are of size 2m x 2m x 2m is excavated
- ❖ The recharge pit comprises different set of filter media. The filter media comprises of thick layers of boulders at the bottom followed by layers of gravels and coarse sand.
- ❖ This enables the filtration of water and also prevents the deposition of silt on the recharge pit.
- ❖ Access Manhole frames and covers are provided.
- ❖ The rain water is also stored in Underground sumps of Life Science block, Mechanical Science Block and New Staff Quarters.

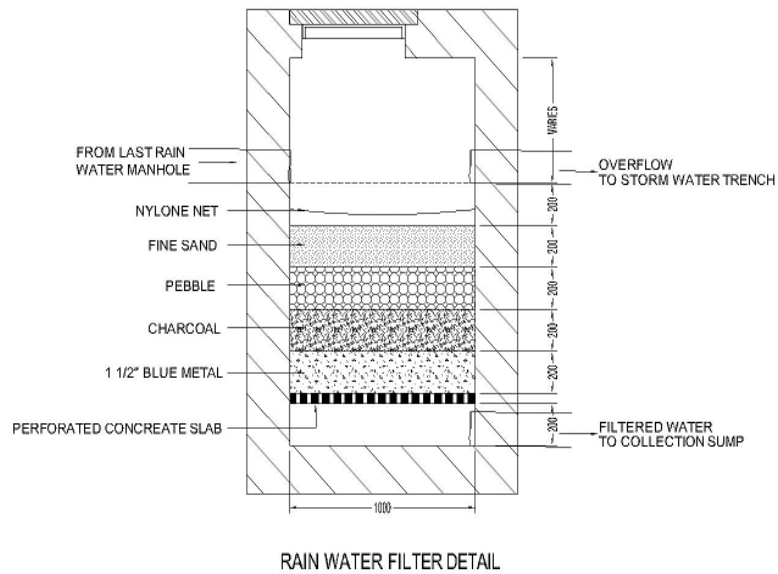
RAIN WATER HARVESTING STRUCTURES AND UTILIZATION IN THE CAMPUS

B.S.Abdur Rahman Crescent Institute of Science and Technology has taken initiatives to install rain water harvesting pits in the campus.

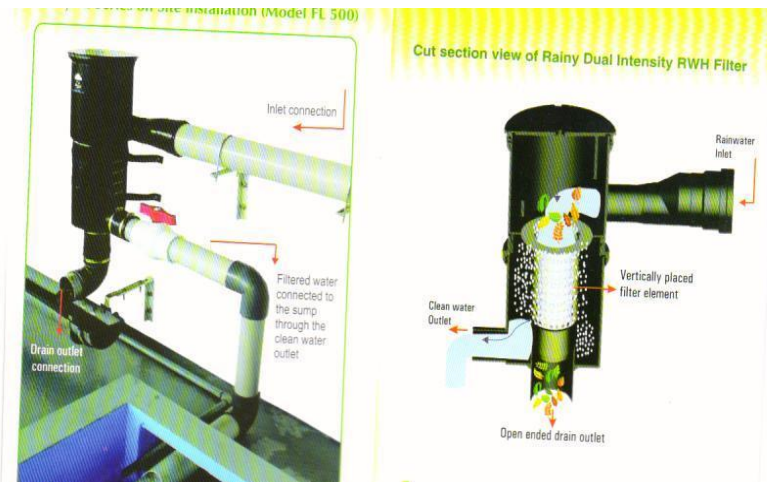
Rain Water Harvesting

Rainwater harvesting facility is done in all blocks to collect rain water from the terrace. The harvested water is diverted to open wells in institute campus, Men's Hostel and ladies hostel. The rain water is also stored in Underground sumps of Life Science block, Mechanical Science Block and New Staff Quarters. The rain water is stored after passing through the pre-filter as shown in Figure below.

S.No	CAMPUS/BLOCKS	Number of Rain Water Harvesting	Quantity of Water Collected(L)
1	College/Life Sciences Block	1	10000(Approx)
2	New Architecture Block	1	10000 (Approx)
3	Computer Science block	1	10000 (Approx)
4	Pharmacy Block	1	10000 (Approx)



The special features of the filtration unit connected with the rain water harvesting system is given as follow



Special Features:

- ❖ Dual Intensity Filter works on the principle of cohesive & centrifugal force.
- ❖ Works on Gravitational force (No external energy required)
- ❖ Compact in size and wall mounted
- ❖ Automatic flush out of dirt particles
- ❖ Flexibility in pipe connection to any angle and degree
- ❖ Provision of bypass valve

In our Institute Rainy filter –FL 500 is used as part of the rainwater harvesting system. The technical specifications of Model FL 500 is given below

Rainy Filter –FL 500

Technical Specifications & Parameters of Model FL 500



Suitable up to area:	500 SQMTRS
Max: Intensity of Rainfall:	75 mm/hr
Working Principle :	Cohesive Force & Centrifugal force
Operating Pressure:	Less than 2 feet of head (0.060kg/cm ²)
Capacity:	480 LPM
Filter Element:	SS-304 Screen
Mesh Size:	250 Microns
Inlet:	110 MM
Clean Water Outlet:	90 MM
Drain Outlet:	110 MM
Housing:	High Density Polyethylene
Efficiency of Filter:	Above 90%
Source of Power:	Gravity

The characteristic features of FL Series Dual Intensity RWH Filter are its capacity to take up the load up to 10 to 500 square meters of Roof area with variable intensity of rainfall of 5 to 75 mm/ hour with a discharge capacity of 10 To 480 Liters per minute.

RAIN WATER HARVESTING STRUCTURES IN CAMPUS



RAINWATER HARVESTING PIT



RAINWATER COLLECTION WELL



RAINWATER HARVESTING PIT AT LIFE SCIENCE BLOCK



**FILTER UNIT IN RAINWATER HARVESTING SYSTEM
(ARCHITECTURAL BLOCK)**



Latitude: 12.875493
Longitude: 80.082849
Elevation: 39.08m
Accuracy: 3.8m
Time: 11-19-2019 13:45
Note: rwh i

RAINWATER COLLECTION SUMP (ARCHITECTURAL BLOCK)



Latitude: 12.875525
Longitude: 80.083737
Elevation: 78.68m
Accuracy: 10.8m
Time: 09-22-2020 15:26
Note: rain water fee block 3

**FILTER UNIT IN RAINWATER HARVESTING SYSTEM
(COMPUTER SCIENCE BLOCK)**

Rainwater harvesting facility is done in all blocks to collect rain water from the terrace. The details are listed below.

Rain Water Harvesting Details				
S.No	Inlet Pit Detail	Area (sq. m)	Rain water filter capacity (Litres)	Location
1	Inlet pit-1	156	200	Mechanical Science Block
	Inlet pit-2	122	200	
	Inlet pit-3	296	300	
	Inlet pit-4	175	200	
	Inlet pit-5	243	300	
2	Inlet pit-1	191	200	Ladies Hostel-New Block
	Inlet pit-2	188	200	
	Inlet pit-3	132	200	
3	Inlet pit-1	68	100	New Staff quarters
	Inlet pit-2	65	100	
	Inlet pit-3	81	100	
	Inlet pit-4	66	100	
	Inlet pit-5	81	100	
	Inlet pit-6	66	100	
4	Inlet pit-1	61	100	Men's Hostel-A&B BLOCK
	Inlet pit-2	71	100	
	Inlet pit-3	43	100	
	Inlet pit-4	132	200	
	Inlet pit-5	132	200	
	Inlet pit-6	43	100	
	Inlet pit-7	71	100	
	Inlet pit-8	61	100	
5	Inlet pit-1	297	300	Men's Hostel -C& D BLOCK
	Inlet pit-2	297	300	
6	Inlet pit-1	71	100	Men's Hostel -PG BLOCK
	Inlet pit-2	71	100	
	Inlet pit-3	71	100	
	Inlet pit-4	71	100	
	Inlet pit-5	71	100	
	Inlet pit-6	71	100	
	Inlet pit-7	71	100	
	Inlet pit-8	71	100	
7	Inlet pit-1	275	300	Pharmacy Block
8	Inlet pit-1	340	300	Library Block

ENERGY EFFICIENT APPLIANCES IN THE CAMPUS

LED Fixtures

LED light fixtures are being extensively used for all new interior renovation works in the campus. So far, 50.87 kW capacities of LED lights are fixed which provide around 70% energy saving compared to conventional lighting.

SL NO	Buildings	QTY	TOTAL WATTS
1	Auditorium	156	2059
2	Science block	250	2829
3	Aero block	458	5064
4	Main block	42	602
5	MBA block	23	597
6	First year block	7	105
7	Life science block	80	1818
8	Staff quarters	341	4295
9	Ladies hostel	284	3974
10	Campus street light	136	3730
11	Medical	21	309
12	Pharmacy	13	601
13	Gm office	27	510
14	Canteen	29	682
15	VC office	72	450
16	VC villa	27	193
17	Guest house	17	280
18	Drivers cabin	8	120
19	Staff quarters	5	45
20	Sports lighting	29	5800
21	HR office	5	60
22	Parents waiting hall	12	166
24	New architecture block	588	10288
25	Civil yard class rooms	30	450
26	CSB room Men's hostel	32	480
27	Robotics lab	22	280
28	Research scholar room chemistry	4	144
29	Food waste management plant	8	220
30	Solar street light	10	250
31	Men's hostel	182	1166
32	MBA phase 1	49	595
33	MBA phase 2	80	588
34	Computer science lab	24	250
35	Purchase office (EO)	2	30
36	CIIC block	88	1624
37	CIIC 2nd floor studio	13	225
Total		3174	50879

BEE 5-Star Rated Air Conditioners

With an emphasis to energy conservation, all split AC units purchased since the year 2012 are of BEE 5-star energy rating. The AC units are free from ozone-depleting CFC.

MODEL	QTY	TON
1.0 TON Split Inverter	17	17
1.5 Ton Split 5*	29	44
2.0 Ton Split 5*	71	142
TOTAL	117	203

Passive Infrared Motion Sensor Lights

Motion Sensor lights are provided in computer science lab, staff cabins and toilets for energy savings.



Staff Cabin



Computer lab

WIFI Connectivity:

In Institute, whole campus covered with 100% WIFI facility.

AIRCONDITIONING:

Total Number of unit's category wise

S.No	Location	Type of Units	No.of Units
1	Auditorium	75TR Chiller units	2
2	Auditorium	16HP VRF Units	1
2	School of Life science Block 6,7 th floor	18HP capacity Daikin make VRF system	1
3	Academic Blocks	Window AC	124
4	Academic Blocks	Split Ac units	217
5	Academic Blocks	Cassette type	32
7	Computer science block	12HP VRF Units	1
8	MBA block	16HP VRF Units	1
9	MBA block	5.5Ductable AC Units	1
6	School of Mechanical science Block 1 st floor Dean room	5 HP capacity Daikin make VRF system	2
7	New Architecture block 2 nd floor	5HP VRF Unit	1
8	Green Room	2.5TR/2TR Cassette	2
9	Ladies Hostel	24HP VRF unit	1
10	Ladies Hostel	Window AC	4
11	Ladies Hostel	Split AC	17
12	Men's Hostel	24HP VRF unit	2
13	Men's Hostel	Window AC	2
14	Men's Hostel	Split AC	52

ELEVATOR FACILITY

S.No	Academic Building	No of Lifts
1	Auditorium	1
2	Science block	1
3	Life science block	2
4	Mechanical Science block	2
5	New Staff Quarters	2
6	First year block, Main, MBA block	3
7	New Ladies Hostel	2
8	New Architecture block	2
	Total	15

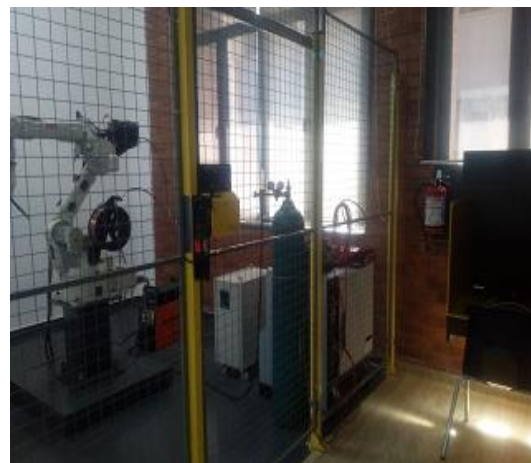
S.No	Hostel Building	No of Lifts
1	A block	2
2	B Block	2
3	C Block	2
4	D Block	2
5	Kitchen Dumb waiter	1
	Total	9

SAFETY AND SECURITY MEASUREMENTS

FIRE FIGHTING AND SAFETY MEASURES

- ❖ Due to the proliferations of electronic equipment, hazardous, chemicals and high density of human activity fire safety and firefighting has assumed paramount importance. Fire can cause tremendous loss of costly equipment, structural damage to buildings besides creating panic amongst staff and students & which may also result in loss of precious lives.

- ❖ 2. With diverse and rapidly expanding laboratory facilities proper precautions need to be taken and specific appointments held responsible for fire prevention measures in each Institute/ School. Instructions herein are to be understood only as broad guidelines & each Institute is responsible for evolving detailed instructions, as specifically applicable to their Institute/ School. Institutions must also draw detailed plans for evacuation and removal of costly equipment which can be saved without endangering life besides ensuring control on students/ onlookers who may hamper Fire Fighting efforts.



Fire Installation of Fire Extinguishers in the Campus

S.No	Location	Type	Capacity (kg)	Qty
1	Auditorium	ABC	5	19
		ABC	2	1
		Total		20
2	Electrical Science Block	ABC	5	8
		ABC	2	16
		AFFF	9	2
		ABC	4	2
		CO2	4.5	1
	Total			29
3	MBA Block	ABC	5	16
		ABC	2	1
		ABC	4	3
	Total			20
4	Data Centre	ABC	10	1
		ABC	5	4
		CO2	4.5	1
		Total		6
5	Computer Science Block	ABC	5	12
		ABC	2	18
		CO2	4.5	2
		CO2	3.2	2
		Total		34
6	Canteen	ABC	5	3
		CO2	4.5	1
		Total		4
7	Pharmacy Block	ABC	5	1
		ABC	4	4
		Total		5
8	Mechanical Science Block	ABC	5	1
		AFFF	9	2
		CO2	4.5	2
		CO2	22.5	1
		DCB	5	1
		ABC	4	14
		CO2	2	7
		Total		28
9	Power room	ABC	5	8
		CO2	4.5	1
		CO2	22.5	2
		Total		11
10	Men's Hostel	ABC	5	18
		CO2	4.5	9
		ABC	4	56
		Total		83
11	Basic science Block	ABC	5	13
		ABC	2	1
		ABC	1	1
		Total		15
12	Estate Office	ABC	5	3
13	Life science Block	ABC	6	3
		ABC	4	5
	Total			8

14	Women's Hostel	ABC	5	6
15	CIIC Block	ABC	4	6
16	Arabic College	ABC	5	11
		ABC	2	2
		CO2	4.5	1
	Total			14
17	Architecture Block	ABC	4	12
		CO2	4.5	4
	Total			16
18	VC villa	ABC	2	1
		CO2	4.5	1
	Total			2
19	New Staff Quarters	ABC	4	9
		CO2	4.5	2
	Total			11
	Grand Total			321

CCTV Surveillance

Sl.No	Location	Nos
1	First year block	2
2	Aeronautical Block	9
3	Convention Centre	15
4	Convention Centre seminar hall	10
5	Estate Office Road + New Architecture Block	14
6	GST Road	2
7	Computer Science Block + Library + Pharmacy Dept	8
8	Ladies Hostel + Staff quarters + Check post	11
9	Life Science /MBA block	5
10	Men's Hostel A Block	25
11	Men's Hostel B Block	32
12	Men's Hostel C Block	25
13	Men's Hostel D Block	25
14	Men's Hostel PG block	18
15	Men's Hostel Main block and passage	31
16	Main block	5
17	VC Office	4
18	Men's Hostel Mess	14
19	Arabic college	4
20	Exam cell	10
21	VC Villa	3
22	Innovation & Incubation Centre	16
23	BSAU General Store	9
24	Medical hall	11
25	Store	9
	Total	317

TRANSPORT – POLLUTION FREE ENVIRONMENT

- ❖ The Transport Department provides a safe, comfort and pleasant travel to the Institute transport users.
- ❖ Total 48 vehicles which were been used for students & staff trips, water consumption for Institute and schools. Regular follow- ups are made to provide on time Insurances, Fit condition certificate and permit to all our Institute vehicles.

Sl.No	Vehicle type	Nos
1	Swaraj Mazda -Non AC	4
2	Tempo Traveller – Non AC	2
3	Eicher – Non AC	1
4	Tempo Traveller AC	1
5	Bharat Benz - AC Bus	15
6	Eicher – AC Bus	1
7	Ashok Leyland AC Bus	4
8	Cars	14
9	Ambulance	1
10	Water Tankers	5
	Total	48

- ❖ All vehicles are provided with speed governor as per RTO norms
- ❖ All vehicles except cars are provided with Neo-track software for vehicle tracking.



15 Nos. new AC buses purchased which are BS-IV (BHARAT BENZ) compliant vehicles, have been provided for induction into the student transport fleet from 2018.

Green Practices

- Students, staff using
 - a) Bicycles
 - b) Public Transport
 - c) Pedestrian Friendly Roads
- Plastic free campus
- Paperless office
- Green landscaping with trees and plants

BICYCLES: BICYCLES FOR POLLUTION-FREE ENVIRONMENT

- As a step towards complete pollution-free environment in campus, 50 numbers of bicycles are provided for use by Men's Hostel students to commute from Main gate to Hostel and to avoid two-wheelers movement inside campus.
- Bicycles are also provided for lady's hostel inmates.
- The provisions for parking the cycles are provided both in the Main gate and also in the front gates for the benefit of the students.
- More than 95% of the day scholars walk from the gate to their blocks
- Only 10% of faculty members use motored vehicles.

PUBLIC TRANSPORT:

- Our Institute is located in the arterial GST Road and is well connected from all areas of Chennai city and suburbs by public transport facilities like Suburban Train and Bus terminus. Nearest Train station is Vandalur at 1km distance and Vandalur ZOO Bus terminus is situated at the Institute gate.
- Most of the day scholars and faculty members use public transport only – either bus or train- for daily commuting.

PEDESTRIAN FRIENDLY ROADS:

- Roads inside campus are strictly prohibited for use of two-wheelers and four-wheelers except utility vehicles. The roads are fully used only for pedestrian purpose.
- All vehicles should be parked in the respective places allotted by the security and they are not allowed to enter beyond the barricade placed at the entrance of the campus, unless if there is an emergency or special case.

PLASTIC FREE CAMPUS:

- A policy is in place to convert our campus into a Plastic-free campus. Within the context of our Green campus policy we commit to ban the use of plastics, to reduce the environmental impact of waste plastics.
- Usages of plastics are avoided in the canteen by serving the food in the steel plates.

PAPERLESS OFFICE:

- Electronic documentation is maintained in 50 percent of the cases. All communications to faculty members and students are through e-mails and SMS.
- The student's attendance, faculty attendance, leave applications, continuous assessment tests results and semester end exam results are all maintained through TCS ION.

GREEN LANDSCAPING WITH TREES AND PLANTS

- The campus had 909 trees before the cyclone in December 2016. A total of 341 were trees were uprooted in the cyclone. Now the total number of trees in campus is approximately 3094Nos.
- Organic Vegetable garden is formed in open land space in Men's Hostel area. The entire campus is dotted with trees, plants and lawns which are kept well maintained. Green cover is around 30 %.
- Total campus built up area:1618024 sq.ft
- Total landscape :656876 sq.ft

The other green practices include

- Solar Power plant
- Biogas plant
- Sewage Treatment plant
- Bicycle
- E- waste Disposal
- Bio waste Disposal
- Green Building Certificate
- LED Fixtures
- Air-conditioning split units of 5-star BEE rating
- BS-IV compliant vehicles for transportation
- Incinerator Machine with wet scrubber for sanitary napkin disposal.

DOCUMENTAL EVIDENCES FOR GREEN PRACTICES

B.S.Abdur Rahman Crescent Institute of Science and Technology has implemented many initiatives to ensure that the campus is pollution free.

BICYCLES FOR STUDENTS



Bicycles

ECO FRIENDLY VEHICLES



Battery Operated Golf cart



Electric Bike



Eco Friendly Load Vehicle

PUBLIC TRANSPORT



VANDALUR RAILWAY STATION

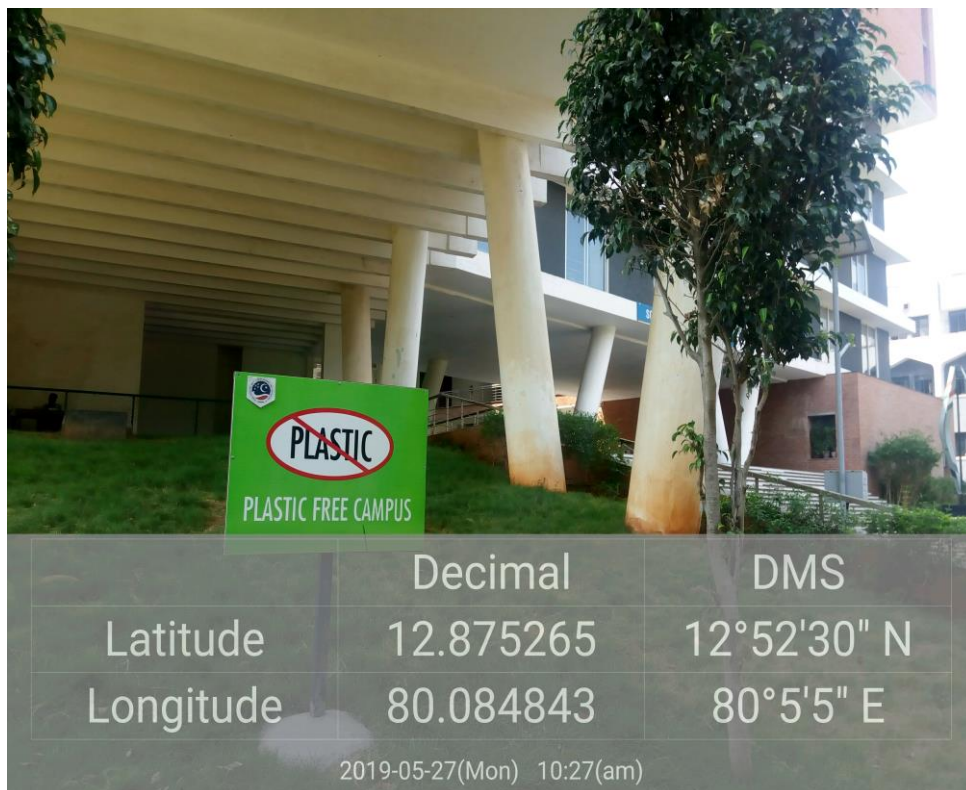
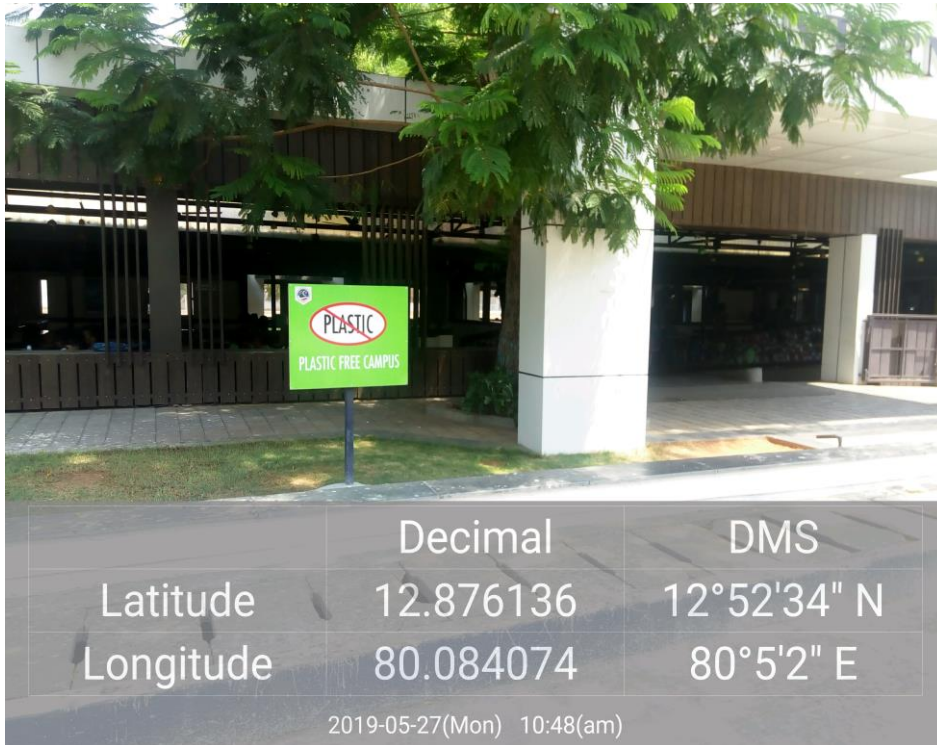
VANDLAUR ZOO BUS STOP



PEDESTRIAN FRIENDLY ROADS



PLASTIC FREE CAMPUS



PAPERLESS OFFICE – TCS ION

Faculty_Homepage

B.S. Abdur Rahman
Crescent
 Institute of Science & Technology
 Deemed to be University u/s 3 of the UGC Act, 1956

360 DEGREE VIEW

PROFILE TIME TABLE ATTENDANCE MARKS LEAVE APPLICATION Library

Dear Faculties, Please complete the CAT 2 Mark Capturing as soon as possible. The last date for mark entry is 15th Apr 2019.(Except B.Arch and

Welcome to Self Service Portal

This portal will give you quick access to your most used functionalities and also help you to perform some actions. For example, to enter student scores, click on the "Marks" icon. To return to Home Page, click on X or

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Classwise Attendance Percentage	Subjectwise Attendance Percentage	View Leave	Feedback Responses
CAT 1 Marks	CAT 2 Marks	Internal Marks - Consolidated Report	Format 1-Results of Examination
Format 1-Report B-Pharmacy	Format-2-Consolidated Report	Result Analysis	Magazine



Institution Vehicles

CARBON FOOTPRINT

Carbon foot print / Capita						
Activity Data	Type	unit	GHG	Emission factor	Quantity	CO ₂ emission /year
Transportation	petrol	litres	Kg CO ₂ e	2.196	1300	2855
	diesel	litres		2.65	381461	1010872
Electricity		kWh	Kg CO ₂ e	1.2	4376492	5251791
Paper consumption		kg	Kg CO ₂ e	0.683	21900	14958
Water consumption	water supply	cum	Kg CO ₂ e	0.8	160611	128489
Solid waste		kg	Kg CO ₂ e	3.7	259560	960372
Total CO ₂ Emission Per Year		Kg	Kg CO ₂ e			7369336
Over all carbon foot print / year		Ton				7369
Total population (avg)						7000
Carbon Foot Print per capita in Ton						1.05

National average per capita **1.58 Ton/Capita/Year**

Actual CO₂ emission **1.05 Ton/Capita/Year**

% of CO₂ emission - on national avg. **66.63%**

% of CO₂ reduced from National avg. **33.37%**

CARBON OFFSETTING

Total Carbon Emission : 7369 tons/year				
Classification of Green Areas	Area	Unit	CO₂ (avg.) absorption rate t/year	Total CO₂ absorption ton/year
Area of Tree - ref Google Map	2	Acre	160	336
Lawn & plant area	14	Acre	15	211
Beema Bamboo	2.5	Acre	80	200
Total green area in acre	19	Acre		
Total CO ₂ Absorption				747
% of CO ₂ offset within the campus				10.13%
% of Green Area				37.86%

❖ 10 % of Carbon foot print is offset by the above environment – friendly measures in campus.

Calculation:

Carbon Offsetting

Total trees green area	-	19 Acres
Total Co ₂ absorption ton/year	-	747 tones
Over all carbon foot print/year (Co ₂ Emission)	-	7369 tones
% of Co ₂ → offsetting within campus (747 / 7369 X 100)	-	10.13%
Bal: 90% to be offset by planting more trees or trading		
% of Linear area (19/50 Acres - carbon foot print)	-	38%

Carbon Footprint

Total Co ₂ Emission per year: Kg	⇒	-	7369336
Over all carbon foot print / year =	$\frac{7369336}{1000}$	-	7369 tones
Total Population (Avg.)		-	7000 (students)
Carbon foot print per Capita in Ton =	$\frac{7369}{7000}$	-	1.05
National Avg. per emission		-	1.58 / ton / capita / year
Actual Co ₂ Emission		-	1.05 / ton / capita / year
% of Co ₂ Emission on National Avg.	$\frac{1.05}{1.58} \times 100$	-	66.46%
% of Co ₂ reduced from National Avg.	$100 - 66.46$	-	33.54%

GREEN LANDSCAPING WITH TREES AND PLANTS

The campus had 909 trees before the Vardha cyclone in December 2016. A total of 341 trees were uprooted in the cyclone. 451 trees are newly planted in the last 3 years and are being well maintained. Beema Bamboo Plants 2075 numbers has been planted in whole campus to reduce Co2. Now the total number of trees in campus is 3094 Nos. List of trees are available now in our campus and tabulated below.

List of Trees in Campus

TREE NAME	TOTAL Nos
NEEM TREE	272
PORTIA	51
TAMARIND	22
MANGO TREE	33
BRACKEN TREE	253
COCONUT TREE	48
SPIKELET	145
ASH	40
ARECA	49
CASUARINA	36
SPASMA	6
ALMONDS	18
KING TREE	3
BANYAN TREE	4
PALMYRA	4
TEAK TREE	35
BEEMA BAMBOO PLANTS	2075
TOTAL	3094

OXYZONE CAMPUS – BEEMA BAMBOO PLANTATION

Planted bamboo saplings for 5000 run area throughout our compound to absorb dust, CO₂ and to release more oxygen and to create pollution free environment. In future, Central bus stand will produce lot of pollution inside our campus, by planting bamboo, our campus become dust free zone with good oxygen supply. Our Institute is provided first OXYZONE inside our campus. Beema Bamboo Plants 2000 Nos Planted in whole campus for CO₂ reduction.



OXY PARK

Oxy Park created in the campus opposite to Convention Centre



Oxy Park

GREEN BUILDING IN CONSTRUCTION

Sustainable and eco-friendly campus development has been adopted with following materials

- ❖ Grass Crete: Method of laying Grass paver flooring, walkways, sidewalks and driveways to improve storm water absorption and drainage
- ❖ Ash Crete: Fly ash (recycled) content with cement is being used for all Reinforced Cement concrete works.
- ❖ Low - VOC paints: Painting with low VOC less than 50gm/liter is using for all painting works - Nippon and Berger
- ❖ Engineered wood: MDF (Medium Densified Fibre) wood used for interior partition, doors and furniture's.
- ❖ Structural Insulated Panels (SIP): Foam board wall panels are used for prefab structures such as class room and indoor game space.
- ❖ Insulated Concrete Forms: GFRG Technology being adopted to construct parent waiting guest rooms and essential staff quarters.
- ❖ Steel: Steel roof panels (recyclable) used for workshop roofing.
- ❖ Composites: Roof panels made of composite materials such as foam sandwiched between two metal sheets used for prefab class room ceiling.
- ❖ Fibreglass: Fibreglass is also used in insulation in the form of Fibreglass batts for interior partition works.
- ❖ AAC Blocks: Autoclaved Aerated Concrete blocks (non- toxic product) are used for the construction of all buildings to reduce low environmental impact.
- ❖ Thermatek Roof tile: Heat Resistant Terrace tiles are used for all buildings.
- ❖ VAV system: Variable air volume HVAC system is adopted to reduce energy consumption



Grass crete



30% Roof top with Heat Resistant Tiles & Solar reflective Index (SRI) value : 97

Environment and Campus

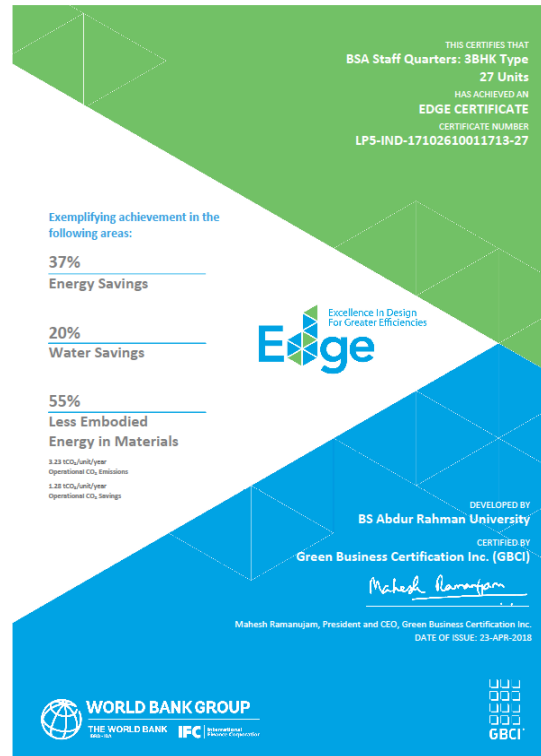
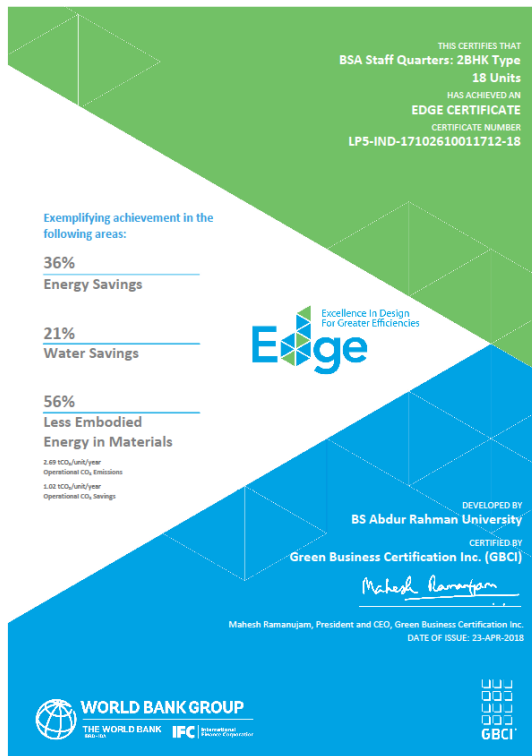
- ❖ 1.Green open space and Landscape
- ❖ 2. Preservation of Eco - system
- ❖ 3.Public space for students and staffs - Cafe, Lounge, Square Garden
- ❖ 4.Recycling based campus
- ❖ 5.Enhancing sustainable consumption of available resources i.e water & Energy.
- ❖ 6.Promoting low - carbon practices among campus community.
- ❖ 7.Minimizing waste and pollution through effective waste management.
- ❖ 8.Innovation in building Design with improved daylight and natural ventilation

GREEN BUILDING AND CERTIFICATION

GBCI-EDGE GREEN BUILDING CERTIFICATION FOR LADIES HOSTEL



GBCI- EDGE CERTIFICATE FOR STAFF QUARTERS



CRESCENT SCHOOL OF ARCHITECTURE BLOCK, IS DESIGNED AS A NET ZERO ENERGY BUILDING AND REGISTERED UNDER USGBC-LEED GOLD CERTIFICATION

New Crescent School of Architecture block, is designed as a Net Zero Energy building and registered under USGBC-LEED Gold certification.

ARCHITECTURAL BLOCK - DESIGNED AND BEING CONSTRUCTED AS A "NET ZERO ENERGY GREEN BUILDING" ONE OF THE FIRST ACADEMIC BUILDING IN SOUTH INDIA TO BE A NZEB

Define Net Zero Building

A zero-energy building, also known as a zero net energy (ZNE) building, net-zero energy building (NZEB), or net zero building, is a building with zero net energy consumption, meaning the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site.

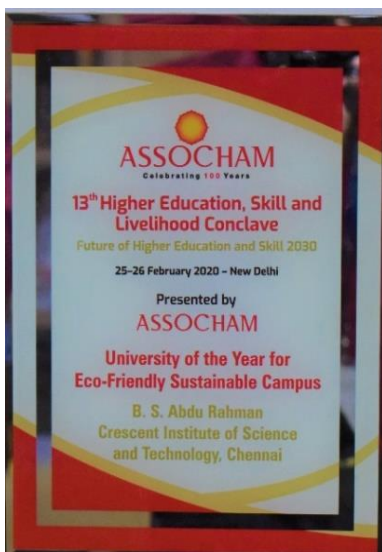


Crescent Scool of Architecture

S.No	Name of the building	Plinth area	Covered area	Estimated cost	Date of completion	Certificate applied to
1	School of Life sciences Block	58,000.00	G+7 (RCC)	110,200,000	2013	USGBC
2	School of Mechanical science block	135,000.00	G+7 (RCC)	310,500,000	Dec 2014	USGBC
3	VC Villa	4,300.00	G+1 (RCC)	9,030,000	May 2014	GBCI EDGE
4	Staff Quarters - Phase 1	75,000.00	G+9 (RCC)	150,000,000	May' 2015	Received on 23.04.18
5	New Ladies Hostel Block - Phase 1	50,000.00	G+8 (RCC)	100,000,000	Dec'2015	Received on 23.04.18
6	New School of Architecture block	98,000.00	G+7 (RCC)	196,000,000	July 2017	USGBC

AWARDS & ACHIEVEMENTS OF THE INSTITUTE

- ❖ Mahatma Gandhi National Council of Rural Education Department of Higher Education, Ministry of Education Government of India has certified B.S. Abdur Rahman Crescent Institute of Science & Technology, Chengalpattu, has a **Recognized Social Entrepreneurship, Swachhta & Rural Engagement Cell (SES REC) Institution**. The Institution has successfully framed the SES REC Action Plan and constituted ten working groups for improving facilities in the Campus and the Community/Adopted Villages in the areas of Sanitation & Hygiene, Waste Management, Water Management, Energy Conservation and Greenery post COVID-19.
- ❖ Our Institute has been participated in MHRD Swachta Ranking 2017, 2018 & 2019 for Higher Educational Institutions.
- ❖ Our institute has been ranked "5" amongst the **"Cleanest Higher Educational Institutions" in the country, in the category - "Residential University"** and the award was presented by the MHRD Minister/Secretary, Government of India on 3rd December 2019 at New Delhi.
- ❖ Our institute has been awarded by AICTE for the significant contribution in the **" Clean & Smart Campus Award 2019"**
- ❖ Our institute has been awarded by AICTE for the significant contribution in the **" Jal Sakthi Abhiyan "**
- ❖ Our institute has been awarded by AICTE for the significant contribution in the **" One Student One Tree" Scheme**.
- ❖ Our Institute has received the **ASSOCHAM award "University of the year for Eco-Friendly Sustainable Campus"** for its eco-friendly self-sustaining efforts in conserving the environment. The award was presented by Dr. Mahendra Nath Pandey, Hon'ble Minister of Skill Development and Entrepreneurship. Govt. of India.



BEST PRACTICES

- ❖ Roof top solar power plant's capacity is 50% of the sanctioned demand
- ❖ **Green campus**
- ❖ Rainwater Harvesting
- ❖ **Biogas plant**
- ❖ Solar water heaters
- ❖ **Sewage treatment plant**
- ❖ Solid, Liquid & E- waste Management
- ❖ **No plastic zone**
- ❖ Several measures have been initiated for Sustainability and Environment consciousness
- ❖ **Green Building Certification**
- ❖ Recycling of papers through ITC
- ❖ **Differently-abled friendly campus**
- ❖ Zero discharge of waste
- ❖ **Adoption of nearby villages**
- ❖ Supporting nearby village Panchayats and Government Organisations

FUTURE PLANS TO IMPROVE UPON THE GREEN CAMPUS INITIATIVES

1. Plans to improve Solid Waste Management program:

The following activities are planned in the near future to further improve solid waste management in the campus.

- ❖ Color Coding System has to be introduced for dust bins in Class Room blocks, Canteens, pathways, hostels, quarters, etc.,
- ❖ All the non-ecofriendly products shall be banned
- ❖ Volunteers from staff and students are to be identified for eco volunteering.
- ❖ A monitoring team shall be formed to focus on waste reduction and segregation,
- ❖ Small size awareness flex card to be pasted in canteen and waste generating area
- ❖ Sapling new trees plantings around college campus.

2. To formulate a Green Policy / Environment Policy for the campus that will guide all activities of the Institute to align with the sustainability initiatives.

3. To get the B S Abdur Rahman Crescent Institute of Science and Technology certified under ISO 14001 for Environmental Management System

4. To get the whole campus certified as Green Campus by competent certification authority like USGBC/GBCI.

5. Create ponds to save run-off rain water and utilize for routine use to reduce water procurement and increase self-sufficiency.