7.1.2 (B)
STANDARD OPERATING PROCEDURE
WASTE MANAGEMENT

Waste Management in Campus

St. Xaviers College Jaipur focuses on SDGs coined by the United Nations. In this discretion the waste policy is being created that focuses on reducing the waste generation. The different type of waste generated in campus includes:

- **Paper shredder machine** is being installed in the offices that reduce the paper into shreds that can be further used in bio-composting
- **Green waste** generated in the campus is reused for manuring the plants after being incinerated
- For the disposal of **e-waste** an MOU was signed with GPS International.
- Heavy metals were not used during experimentation. The **disposal from the laboratories** is neutralized, before draining it off.
- The **metal and glass waste** produced in the campus is disposed off through the local vendor Zero Kabaad under a signed MOU.

Note: The college fosters the policy of reduce, reuse and reduce.

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Waste Management Initiatives in Campus

The organization develops a sustainable way to reduce the waste. The awareness programs were organized periodically by different units on campus; to minimize the usage of plastic and for the promotion of water and energy conservation. Moreover, the college took an initiative towards sustainability by developing a unit for composting namely: vermi-composting and bio-composting respectively. Further, the institute set-up an instrumentation that converts the bio compost into the ash and can be readily used as a manure for plants. The waste management initiative is aligned with the college mission **"To work towards the conservation and protection of the environment for achieving Sustainable Development Goals (SDGs)".**

The maintenance staff of the college is provided with the training regarding the waste collection and segregation of waste. The dustbins were installed in the campus labeled with the different types of waste that further creates the awareness among students and staff about the different types of waste.

Note:

- **The maintenance staff is instructed to collect the wet waste regularly and dry waste need to be removed on Wednesday and Saturday**
- **During the events the waste needs to be disposed off after the event ends.**

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STANDARD OPERATING PROCEDURE

INCINERATOR

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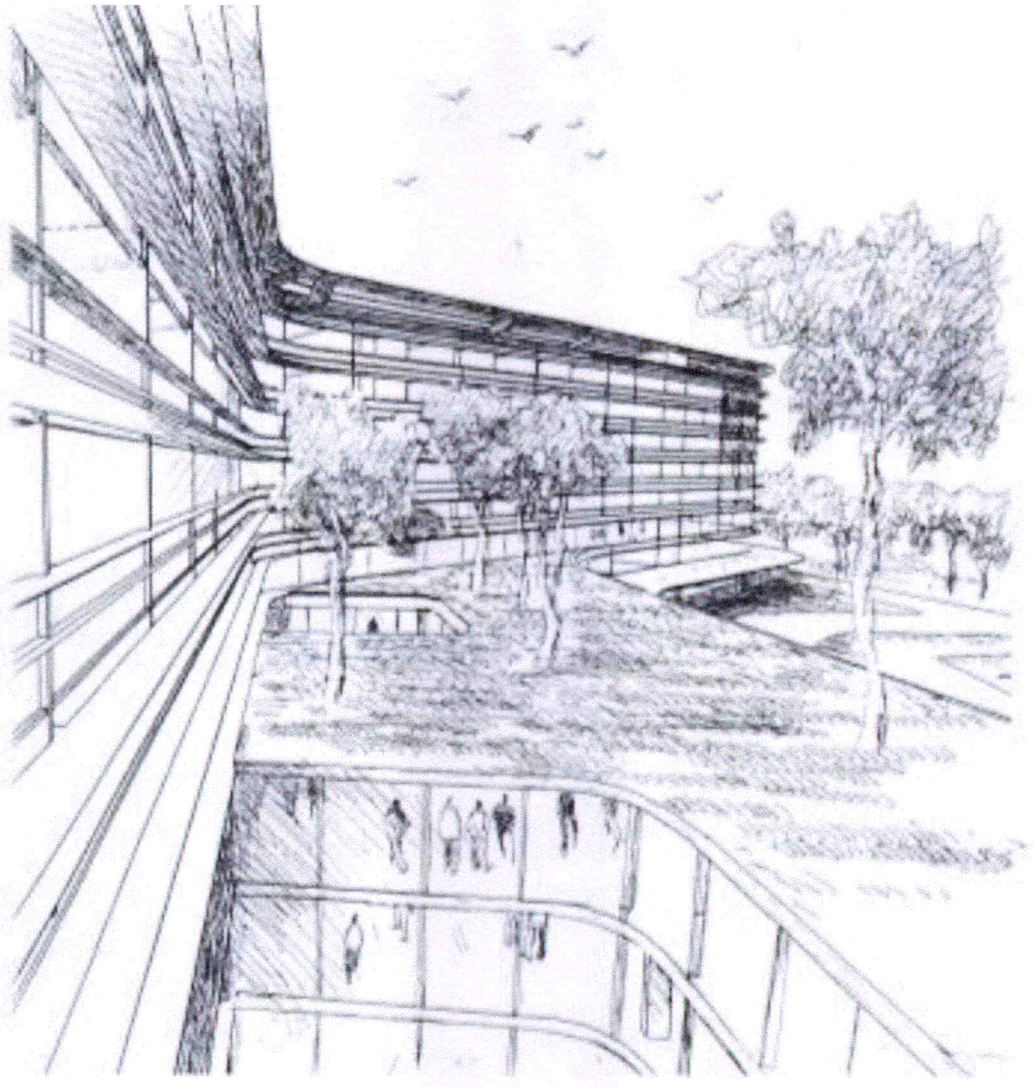
February 28, 2024
Report no: IR-15-130



Solid Waste Management

Prepared for: St.Xaviers College, Nevta – Mahapura Road, Jaipur
Prepared by: Venus Technologies

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GUIDELINE: **DISPOSAL OF SOLID WASTE**

This Guideline is not an official statement of the law and is provided for guidance only. Its intent is to increase the awareness and understanding of the risks, hazards and best management practices associated with the disposal of solid waste. This Guideline does not address disposal of biomedical waste*, hazardous waste** and sewage sludge.

* Biomedical waste refers to any solid or liquid waste which may present a threat of infection to humans including non-liquid tissue, body parts, blood or blood products and body fluids, laboratory and veterinary waste which contains human disease-causing agents, and discarded sharps (i.e. syringes, needles, scalpel blades).

**Hazardous waste refers to a contaminant that is a dangerous good and is no longer wanted or is unusable for its original intended purpose and is intended for storage, recycling, treatment or disposal.

The generator, or responsible party, is the owner or person in charge, management or control of the solid waste at the time it is produced or of the facility that produces the waste. The responsible party must ensure the waste is properly and safely managed from the time it is generated to its final disposal. Contractors may manage solid waste on behalf of the responsible party. However, the responsible party remains liable for ensuring the method of management complies with all applicable statutes, regulations, standards, guidelines and local by-laws.

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WASTES THAT CAN BE **DISPOSED**

Complete combustion converts waste into inert bottom ash with minimal creation of smoke, fly ash and hazardous gases. Several factors influence this process including the heating value, wetness and chemical composition of the waste itself, operating conditions in the burn chamber (i.e. temperature, holding time and turbulence) and operator skill.

Certain wastes can only be incinerated using equipment that has been specifically designed for the purpose. For example, waste containing chlorinated compounds (i.e. chlorinated solvents and PVC piping) must be separated from other waste as their burning will result in the emission of various dioxin and furan compounds.

Waste containing mercury (i.e. batteries, thermostats and fluorescent light bulbs) and other heavy metals (i.e. lead acid batteries, wood treated with lead paint) should not be burned as the mercury and heavy metals will not be destroyed.

Other waste that should not be burned unless using specially designed incinerators include used lubricating oil, hydrocarbon contaminated soil, biomedical waste, sewage sludge or any other waste specifically prohibited by the environment or pollution control authority

Non-combustible materials such as metal and glass do not burn and will rob heat away from waste that can be destroyed by burning. Combustible waste should always be separated from non-combustible waste before being loaded into the burn chamber.

Typical mixed garbage has a moisture content of less than 20% while the moisture content of food wastes can range up to 80%. Anything that can be done to reduce the moisture of waste burned will decrease the amount of smoke produced and increase the completeness of combustion. Waste should be covered or stored inside sheds or other secure buildings to keep rain and snow out of the waste. This will also lessen the opportunity for wildlife to access the waste. If wet waste must be burned, the wet waste should be mixed or layered with dry waste to reduce the overall moisture content of the waste burned. Mixing or layering waste in this manner is particularly important when loading wet solid waste into Venus Technologies Waste Burner.

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VENUS TECHNOLOGIES WASTE BURNER FOR SOLID WASTE DISPOSAL AT SOURCE

Waste burners from Venus Technologies converts solid waste to ash without using electricity or fossil fuel. It uses calorific value present in waste to produce heat energy which converts waste to ash in a matter of hours.

Combustion air is provided using a natural draft making electricity unnecessary. waste burners are single chambered units. Waste is raised off the bottom of the box by placing it on grates inside the unit. Unburned bottom ash falls through the grate during burning making removal easier once a sufficient amount has accumulated. Combustion air in Venus Technologies waste burners is typically provided by draft ports at the bottom of the box allowing for better mixing with the burning waste. The waste is exposed to natural drafts through the metal grating on all surfaces including the bottom. This enables air to better mix with burning waste and promotes more efficient combustion throughout the burning period. The refractory brick lining provides heat retention for longer duration.. The equipment comes with a standard particle collection mechanism which directs the particulates in smoke through a restricted path into a water sealant. Water sealant ensures the required pressure difference at stack for efficient particulate collection.

Stainless Steel construction ensures strong resistance to corrosion and thus long product life. Curved construction improves the structural strength and prevents structural faults from expansion due to high temperature inside burning chamber. high quality mineral wool insulation is provided in side the double hull stainless steel structure to prevent high skin temperatures for the waste burner.

Detailed specification of the installed Venus Technologies Waste Burner is provided for reference.

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TECHNICAL SPECIFICATION OF **GREENX SERIES** WASTE BURNERS

Equipment	Green burner (GreenX series)
Function	Thermal disintegration of inorganic/organic content by heat transfer.
Capacity	1000 Litres main chamber volume (equivalent to100 Kg)
Operation	Continuous combustion using synchronised draft
Operating temperature	600 deg. Celsius min.
Installation Area	2.5mt x 2.5mt approx.
Draft port	8 nos
waste load port	one
Skin Temperature	20 deg. C above ambient

Part Name	Specifications
Hull shell outer	Stainless Steel, SS 202 grade, 3mm
Swirl cone (upper)	SS202 grade with refractory paste lining
Refractory lining	Fusion Temperature 1580 ~ 1780°C Precast acidic refractory bricks high alumina (Al203), high silica (Si02)
Draft Cone (lower)	SS 202 grade, 1.6 mm
Wet Scrubber	Inclined Flow , Multi point Water injection
Stack Mounting Column	MS Grade Angle bar construction – 10 feet
Stack	SS 202, 30 feet , mounted on MS Column
Waste load port with door	MS grade
Ash removal system	MS slider type
Air flow Grate	parallel arrangement MS rods
Access Ladder	checkered plates/ gratings for step

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MAXIMIZING **OPERATION EFFICIENCY**

More smoke is released into the air during the 'start-up' and 'cool down' phases of the burn cycle than during the 'full burn phase' when high temperatures are maintained. Burn only dry feedstock initially and periodically add additional waste to the chamber in order to maintain high burn temperatures until all waste has been destroyed. A rapid 'start-up' can be achieved by first loosely loading dry paper, paperboard packing and untreated wood into the bottom of the device. Dry, loosely loaded material will ignite more quickly and burn more evenly than a wet, tightly packed load. Wet waste should only be added after the fire is actively burning. Overfilling the burn chamber will prevent the turbulent mixing of burnable oxygen, and should be avoided.

Please note that **the following categories of waste are restricted inside a Venus Technologies**

Waste Burner:

The Ministry of Environment & Forest (MoEF), India, in their Bio-Medical Waste (Handling and Management) Rules, 1998, as per its Schedule I (Rule 5) identifies the following categories of waste. **Category No. 1** (Human Anatomical) Waste and **Category No. 2** (Animal) waste as an alternative to Deep burial disposal which is permitted only in cities with population less than 500,000 (half a million). **Category No. 3** (Microbiology & Biotechnology) waste, **Category No. 5** (Discarded Medicines and Cytotoxic drugs) waste, and **category No.6** (items contaminated with blood and body fluids including cotton dressings, soiled plaster casts, linen, bedding, other materials contaminated with blood) waste.

INSTALLATION **FACILITY**

GreenX 100 kg / 1000 L from Venus Technologies is installed and commissioned at the following facility:

St.Xaviers College, Nevta – Mahapura Road, Jaipur
Date of Installation Completion – 29 February, 2024

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WARRANTY FOR THE EQUIPMENT

The equipment is designed to ensure maximum product life and the material of construction is chosen accordingly. Subject to the terms and conditions set out below, Venus Technologies agrees to repair or replace the Product , at its own cost, and any Venus Technologies accessory supplied with it, purchased by You from Venus Technologies, in circumstances where the Product does not perform in accordance with Venus Technologies's specifications during:

(a) the Standard Warranty period of 24months, commencing on the date of delivery (or deemed delivery) of the Product; or

(b) the applicable Extended Warranty period specified, commencing on the date of delivery of the Product

Warranty Conditions

1.1 Proof of purchase (invoice or paid Order confirmation) must be provided when

requesting service under the Standard or Extended Warranties.

2.2 Venus Technologies requires any customer requesting service under the Standard or Extended Warranties to comply with directions from Venus Technologies staff in relation to troubleshooting

any issue and facilitating any repair or replacement under these Warranty

Terms and Conditions.

2.3 Venus Technologies reserves the right to replace the Product or relevant part with the same or equivalent Product or part, rather than repair it. Where a replacement is provided, Venus Technologies will determine, in its discretion, the closest Product within the then current range of Products offered by Venus Technologies with which to replace the faulty or damaged Product. The replacement Product may differ with the replaced Product in size and specifications, at the reasonable election of Venus Technologies. Replacement of the Product or a part under the Standard Warranty or Extended

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warranty does not extend or restart the Standard Warranty or Extended Warranty period.

2.4 If Venus Technologies is unable to repair or replace the Product, the customer will be provided with credit for Venus Technologies's store or may be refunded the price of the Product (at Venus Technologies's election). This credit or refund will be for the amount of the purchase price of the Product excluding the associated Delivery Cost.

2.5 In the event that a replacement, refund, or store credit is provided, the faulty item will become the property of Venus Technologies.

2.8 Venus Technologies reserves the right to determine which repair centre within India is the appropriate service location in any particular circumstance.

2.9 The Product will be at the Customer's risk while in transit to and from the Venus Technologies Repair facility.

2.10 Venus Technologies may seek reimbursement of any costs incurred by us where the Product is found to be in good working order.

2.11 Venus Technologies reserves reasonable discretion to determine whether any Product is or is not performing in accordance with Venus Technologies's specifications, subject to applicable law.

2.12 The Standard and Extended Warranties are transferrable to a new person, provided Venus Technologies is informed by e-mail to venustechcbe@gmail.com within 7 days of the date of transfer.

2.13 The warranty for the product and all the conditions of warranty are applicable subject to full payment of the invoice amount to Venus Technologies by the respective client.

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