

**Techno India NJR Institute of Technology,  
Udaipur**

**NAAC**

पंजाब विश्वविद्यालय  
TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY

**7.1.3**

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Solid waste management  
Liquid waste management  
Biomedical waste management  
E-waste management  
Waste recycling system  
Hazardous chemicals and radioactive waste management

**Solid Waste Management**

Two of the students from Techno NJR (Team : Wricks (Lokesh P Goswami & Kunjpreet Arora) are at the final stage of developing an innovative technology (Patent application submitted) to make low cost, high quality and environmentally sustainable bricks, paver blocks, tiles and panels for low-cost housing. The raw materials required in making these products are wastes like waste plastic, crushed demolition waste, fly ash, and marble slurry. No chemical binders or environmentally expensive binding or processing technology is used for achieving strength. They do not even use water in production process, they only use these major polluting wastes in a synergistic manner. The molten waste plastic acts as a binder, fly ash and crushed demolition waste act as fillers and marble slurry acts as both a filler and fire retardant. Moreover, the processing technology is very simple and does not produce any harmful byproducts. As the filler materials are inert, these can be easily replaced by other inert waste materials after studying their effects of properties of final products.

**Current status**

The project have achieved compressive strength of 14 MPa for the cubes made of this material with optimum mix proportion. This is more than compressive strength of first-class bricks. Wricks is 30% stronger, 40% lighter and water repellent as compared to normal red bricks in the market. Being light in weight and water repellent these bricks have huge scope in humid and seismic zone. Students have also filed patent for this technology and they will be ready to start commercial production by mid-2021.

**Liquid Waste Management**

Dr. Sangeeta Choudhary and five students of Techno have been engaged on “Development of Rain Water Harvesting System through National Highway Profiles by Using GIS and Field Survey”. In this study, an integrated approach for assessing the rainwater harvesting capacity in minimum cost by using GIS and field survey approach for the study area on National Highway 27, Udaipur bypass. In a pilot study of 5 km segment of National Highway 27, it is found that 65 million liters of water can be harnessed for future use by 2000 villagers for about 240 days with per capita consumption of 135 lpcd (litre per capita demand). RS and GIS provide a good opportunity to gain a better understanding of contour pattern, natural and manmade profiles. The result indicates the application of GIS techniques help for conducting detailed field survey for planning the proper drainage system along the highways to store rainwater in the nearest reservoir. The socioeconomic survey was also conducted to select a good insight into the local situation.

**Waste Recycling System**

Requirements of Solid Waste Management System in Savina Vegetable Market at Smart City Udaipur has been carried out by the faculty members of Civil engineering department. After conducting 5 days’ workshop it was estimated that an average per day 3464 kg fruit-vegetable waste, 504 kg paper waste, 111 kg plastic wastes are generated in this market. As per calculation based on this study Rs 15, 60,000 revenue and 5,59,200 profits per year can be generated after expenditure for maintenance of processing center.

## **E-waste System**

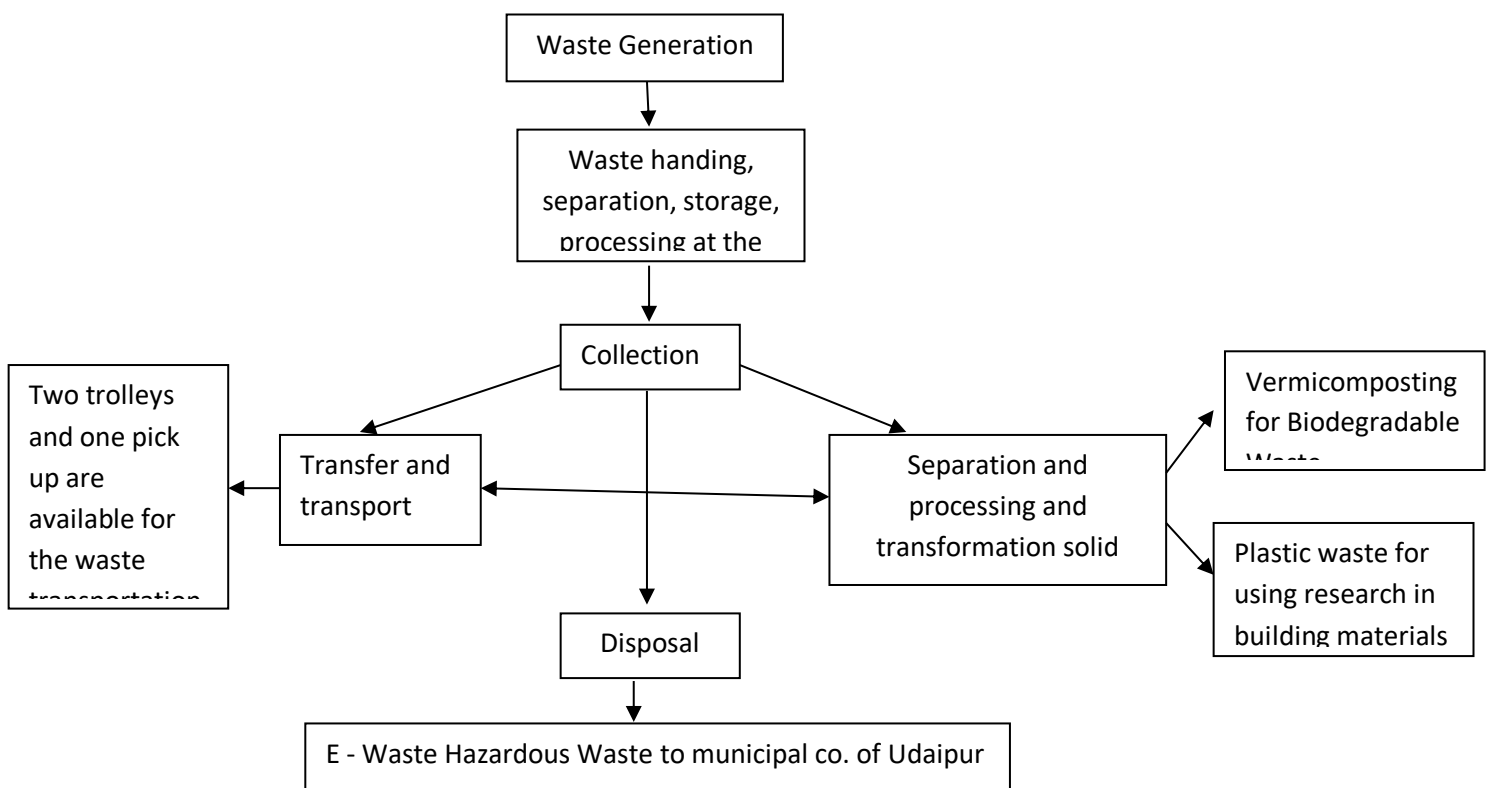
Institute organizes e-waste awareness program/ training for the students and faculties frequently.

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## 1. Solid Waste Management

This Institute has to ensure that all the campus wastes are disposed of responsibly by using proper waste segregation mechanism at the source and, if possible, converting it into a value-added environmentally friendly product.

The Campus has adopted the principles of the 'best practicable environmental option' to deliver its waste management services. The Campus applies a 'waste hierarchical approach' to reduce, reuse, recycle, and recover waste products in preference to waste disposal to landfill. Figure 1 shows a schematic diagram of solid waste management of the Campus.



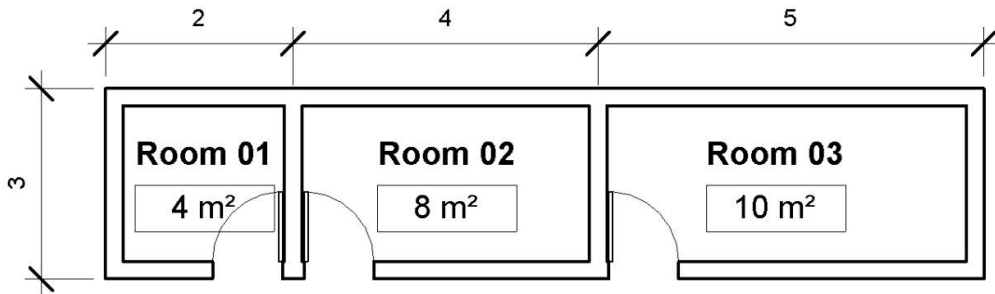
**Figure 1: Interrelationships between the functional elements in Solid Waste Management in Campus**

- Waste Segregation: Source segregation via separate bins as per the waste.

Following color code is used for different types of wastage.

- Green Bins: For biodegradable waste
- Blue Bins: For plastics waste
- Red Bins: Hazardous and Sanitary waste
- Black Bins: For E-Waste

- Dimensions and 3d views of the collection and processing center on the college campus are shown in Figures 2 and 3.



**Figure 2: Area and Dimensions of Processing Center (Outer Dimensions in meter)**

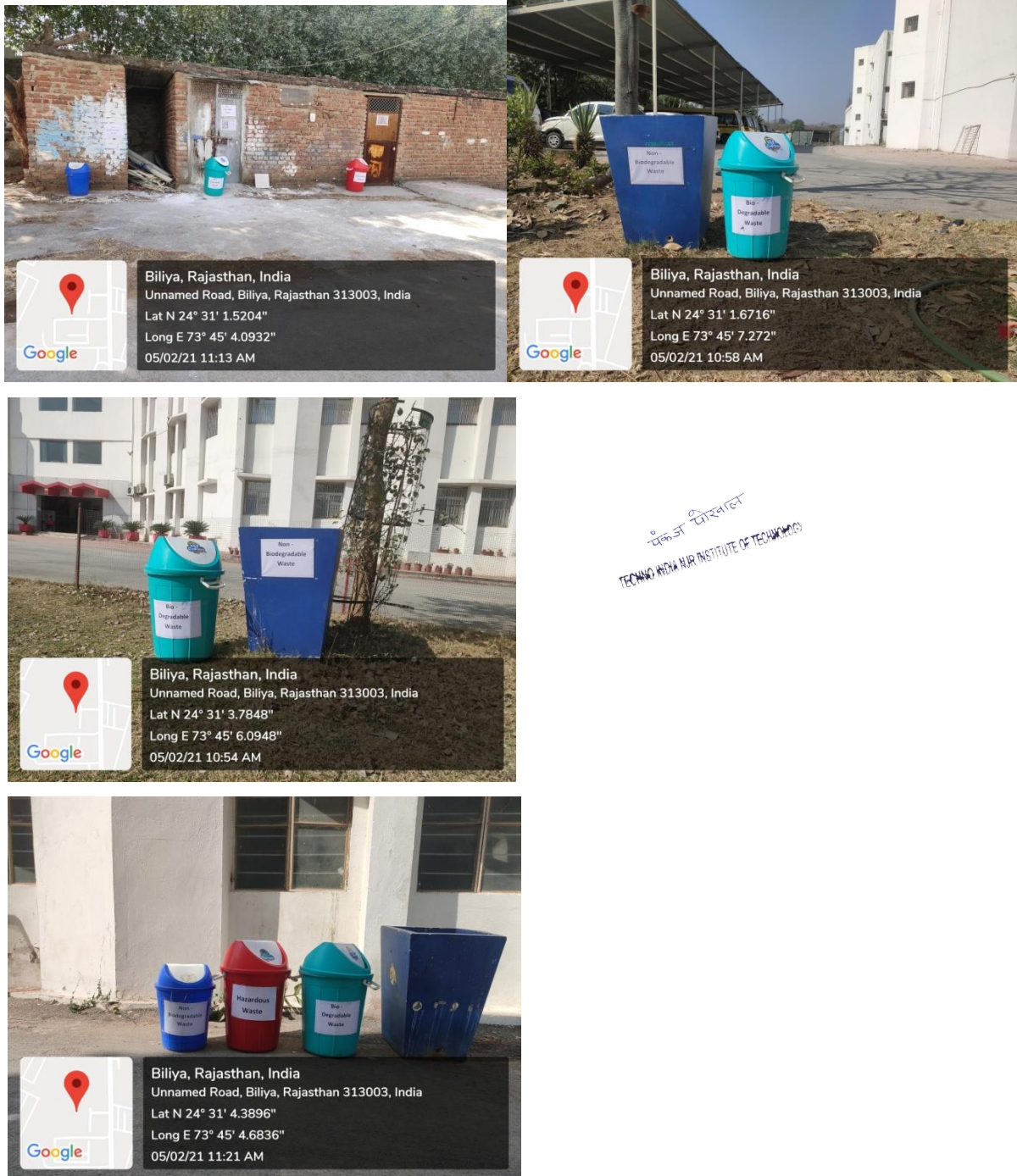


**Figure 3: Processing Center for Waste at the Campus**

- Management Staff
  - Supervisor for the supervision of supporting staff.
  - Supporting staffs will be responsible for
    - i). Cleaning and separate the waste from each facility
    - ii). Collection of separated waste from different colored bins
    - iii). Transport all waste to the collection center of Campus
    - iv). Support all recycling processing activities

- Resources for Waste management:

There are 30 dust bins of different color for collection of solid waste. There is also a garbage collection center for separated waste in the campus. Figure 4 shows geotagged photographs of the facilities.



**Figure 4: Geotagged Photographs of the Waste Management facilities in the Campus of Techno India NJR Institute of Technology, Udaipur**

## 2. Liquid Waste Management:

Wastewater management options and technologies can be functionally divided into two segments. Firstly, septic tanks are used for sewage waste water. Secondly, wastewater from bathrooms is treated through coagulants for the separation of soap and other suspended particles, and this treated water is used for gardening.

## 3. Biomedical and Radioactive Waste Management:

There is no biomedical and radioactive waste generated in the campus.

## 4. Hazardous Chemicals Waste Management:

There are separate red colored bins and room (shown in figure 4) for sanitary and hazardous waste. These types of wastes are disposed on Municipality landfill site outside city.

## E- waste



## Vermicompost plant for biodegradables Waste

