

1. What are public urine diverting toilets?

A public toilet is a toilet facility with free access, regardless of whether or not payment is required to use the premises. Public toilets may be open to the general public or may have restricted access (e.g. in schools, universities, condominiums, etc.).



Fig 1: Public urine diverting toilet at Valley View University, Ghana

The purpose of a urine diverting toilet is the diversion and separate collection of urine and faeces. Urine diversion can be implemented in flush

toilets as well as in dry toilet systems. Specially adapted urinals, sitting toilets and squatting pans are produced around the globe. Both components, urine and faeces, can be treated in accordance to their unique properties. Urine is rich in nutrients and can be used as a liquid fertilizer. Faeces may serve as a substrate for biogas plants or for compost production. Both biogas effluent and compost can be used for the improvement of agricultural soils (see Nutshell Guidelines 001 & 002).



Fig 2: Urine diverting flush toilet and wall hung water less urinal

2. Why is maintenance so important?

Proper maintenance is especially crucial when new systems, such as urine diversion installations, are first introduced and acceptance is critical. Long-term maintenance guarantees that the system functions properly and safely, and extends the life span of sanitary installations.

3. How to organize maintenance?

Maintenance of public toilets can be organized centrally - by institutions or communities, for example, but can also be outsourced to specialised companies. Especially when new and unusual sanitary installations are being introduced, the staff should receive training on maintenance, operation and minor repairs. A check-list of daily and routine tasks is helpful for the operator and a guide for quality control.

4. The nutshell guideline

- *User instructions.* Pictograms are helpful to inform the visitor of proper use of the sanitary equipment. Increasing awareness of the crucial issues regarding long-term facility operation is the role of the operator, who should be informed immediately of failures. Ideally, operation, maintenance and cleaning are assigned to a single individual, sensitising that person to the facility requirements and promoting a sense of responsibility.
- *Cleaning.* The cleaning staff must be supplied with the necessary tools and materials. If treatment and subsequent use of the collected urine and faeces in crop

production is intended, it is important to choose biodegradable cleaning agents. For toilets connected to any waste water treatment system, biodegradable, phosphate-free cleaning products should be chosen. Commercially available cleaners can be substituted by vinegar or citric acid, diluted with water and applied with a spray bottle. The contact surfaces of door handles, locks and taps should be cleaned regularly. Disinfectants should only be used to clean toilet seats and surfaces that are touched with the hands.

- *Hygiene.* Special work clothes must be provided to cleaners and should be exchanged and cleaned regularly. Tools, cleaning materials and work clothes should be stored in a lockable storage room. Work clothes and shoes should only be worn at work. During cleaning, disposable or rubber gloves should be used and hand-washing with soap is obligatory after finishing.
- *Provision of consumables.* Consumables should be made available and replenished regularly. If obtainable, environmentally friendly consumables such as toilet tissue made from recycled paper, easily biodegradable soap and paper towels are preferable. Terry towels should be washed regularly and either ironed or sun-dried.
- *Emptying of storage tanks and containers.* Collecting containers should be emptied during the daytime when the toilets are not in heavy use. This facilitates work and reduces the potential of odour harassment. Urine should be stirred before emptying to avoid build-up of a

thick sediment layer and to fully utilise the phosphorous- and magnesium-rich precipitant.

- *Auditing.* The toilet facilities should be audited periodically to assess maintenance quality and equipment wear. Auditing should assure that installations and equipment are maintained regularly to prevent failures before they occur.

5. Troubleshooting

- *Low utilization.* Facility use is lower than expected; people defecate and urinate elsewhere. Keep the facility clean, bright and ventilated.

- *Grubbiness and vandalism.* People tend to pay little respect to dirty and damaged things. Keep the facility clean, inspect it daily to ensure that it is functioning properly and conduct repairs immediately.

- *Ammonia odour.* When the nitrogen in excreted urine is exposed to air, it is transformed into ammonia and then evaporates. Therefore, ammonia odour indicates poor cleaning or malfunctioning of the urine separation and collection



Fig 3: Membrane odour seal of a dry urinal

system. If cleaning is up to standard, check if the odour seals are in working order, if there is any leakage in the piping system and if the collection tank is full.

- *Blocked urine pipes.* Urine pipes may become blocked by salt precipitation, toilet paper and other matter. Before resorting to dismantling the pipes, attempt to



Fig 4: Manual suction pump for the cleaning of urine pipes

remove the blockage by rinsing with vinegar or citric acid and breaking it up with a suction pump. Aggressive chemicals should be avoided, as they may be harmful to the biological processes during treatment and to agricultural use of the collected materials.

- *Flies.* Insects are attracted when the faecal matter is wet and anaerobic conditions prevail. Aeration can be improved by mechanical mixing or by adding structure material (e.g. shredded paper, card board or wood chips). Cover the faecal matter daily with a layer of saw dust or wood ash.

6. Hygiene considerations

Urine diverting toilets, like any other type of toilet, do not pose a health risk, provided that they are cleaned properly and that visitors wash their hands thoroughly after use.

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Maintenance of public urine diverting toilets...



...in a nutshell