

MINIMUM STANDARDS FOR ONSITE SANITATION TECHNOLOGY OPTIONS FOR SMALL TO MEDIUM TOWNS IN NORTHERN UGANDA





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LIST OF ACRONYMS

| C&T | Collection and transport | NGO | Non governmental organisation |
|------|---|-------|---|
| FS | Faecal sludge | 0 & M | Operation and maintenance |
| FSM | Faecal sludge management | PWD | People with disabilities |
| GIZ | Deutsche Gesellschaft für Internationale Zusammenarbeit | SDGs | Sustainable Development Goals |
| HH | Household | UDDT | Urine Diversion Dehydrating Toilet |
| HWF | Hand washing facility | UNAPD | Uganda National Action on Physical Disability |
| KCCA | Kampala Capital City Authority | VIP | Ventilated Improved Pit Latrine |
| MCA | Multi criteria analysis | WCs | Water closets |
| NEMA | National Environment Management Authority | WH0 | World Health Organisation |
| NSSS | Non-Sewered Sanitation Systems | WSTF | Water Services Trust Fund |

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PREFACE

The popular version presents minimum standards for sanitation technology options that are in common use at households, public places and in institutions. It is a summarized version of the minimum standards for onsite sanitation technology options in Northern Uganda, which can be referred to, for more technology options. The popular version can be used for advocacy and community engagements while having a quick reference/guide about the minimum standards for the commonly used technologies in Northern region.

MENU OF SANITATION OPTIONS

The technology options presented in this guideline are mainly limited to containment (Table 1-1). These are applicable at household level, in public places and institutions. The minimum requirements for each of the options are presented in the subsequent sections.

Table 1-1: Menu of sanitation technology options

| Sanitation Technology Category | Component Technologies | Add-ons / Modifications |
|--|---|---|
| Water borne toilets | a. Cistern flush b. Pour flush toilet | Add-ons i. Septic tank ii. Soak pit iii. Drainage field iv. Twin pit pour flush |
| Lined latrines | a. Ventilated Improved Pit latrine (VIP) | Modifications i. Elevated pit latrine ii. VIP latrine precast |
| Urine Diversion Dry Toilets (UDDTs) | | |

2. HOUSEHOLD TOILETS

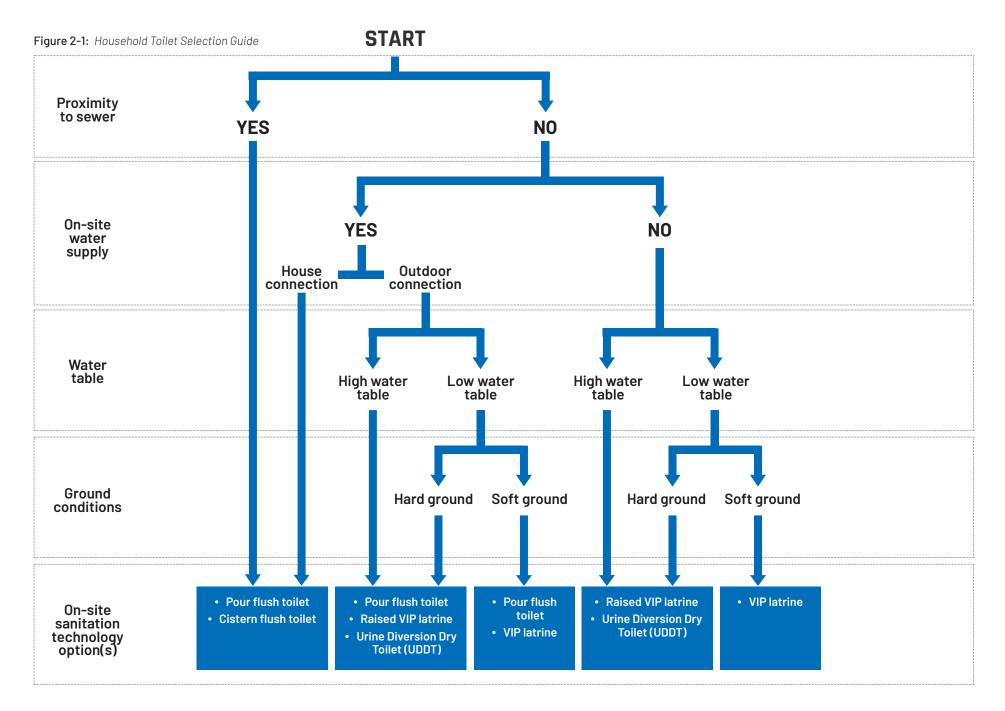
2.1 **GENERAL REQUIREMENTS**

- A single sanitation facility can be located inhouse or outdoors.
- Inhouse sanitation facilities are only limited to cistern/pour flush toilets.
- An inhouse facility should not be entered directly from the area of food preparation and a habitable room except a bedroom.
- A shared facility can have multiple stances, with each stance limited to a maximum of 4 households.
- Connection of sinks, showers and toilets through a drainage trap to drainage system.
- Greywater from the kitchen should be connected to discharge system or septic tank via a grease trap.
- vii. Septic tanks must be positioned so that they are accessible for emptying by trucks.
- viii. Superstructure can be built from permanent materials or any other whose performance has been approved by authority.
- Smooth finish for floor and walls of the superstructure.
- Where applicable, allow support rails and ramp for PWDs.
- xi. Provide holder or container for anal cleansing material.
- xii. Provide container for MHM.
- xiii. Discharge drain pipes of minimum 100 mm (4 inches).

2.2 SELECTION GUIDE

The key factors influencing the decision on options to adapt include:

- i. socio-cultural including acceptability, perception, and usability,
- ii. environmental related to pollution and pathogen risk,
- iii. socio economic number of users, affordability and resource optimization/re-use,
- iv. physical environment including ground/soil conditions, ground water table levels and available land area,
- v. physical development of an area, and
- vi. water availability and service levels.



2.3 LINED VENTILATED IMPROVED PIT LATRINE (VIP)

- This comprises a pit for containment of faecal sludge and a vent pipe that serves to prevent flies and odor from the pit.
- Pits are lined to prevent contamination of ground water and allow for emptying when full.
- The main features of a lined VIP are: a superstructure, lined substructure or pit, vent pipe, slab and access provision for pit emptying.
- This serves as the minimum option for households, institutions and public places in Northern Uganda.

| KEY MINIMUM STANDARDS FOR VIP LATRINE | |
|---|--|
| Has access to facilitate emptying services. Pit should be emptied when contents are within 0.5 m below slab level. Light for night use. Stance to user ratio. Reinforced concrete slab thickness. | 1:5 50 mm |
| VIP Latrine Location: | |
| Minimum distance from any habitable room/kitchen/food stores: Minimum distance from any plot boundary: | 10m 1.5m |
| Vent pipe details: | |
| Minimum pipe diameter: Minimum distance between top end and the highest part of the roof: Fly screen (mesh) openings/holes: Connection to slab should be completely sealed: | 110mm at least 300mm Max 1.5mm |
| Lined pit considerations: | |
| Minimum internal effective depth: Pit width: Pit bottom above the water table: Thickness of reinforced concrete slab above the pit: Drop hole length: | 3.0m 1.2m 1.5m 50 mm Max 250 mm |
| Superstructure/room details: | |
| Floor internal dimensions: Height from the floor to underside of ceiling: Dimension from hind superstructure wall to squat hole: Door raised from the floor to allow in air: Floor level above the surrounding above ground level: Door height: Door width: | 1.0m x 1.5m 2.15m Min 110 mm 50 mm Min 150 mm 2100 mm Min 750 mm |

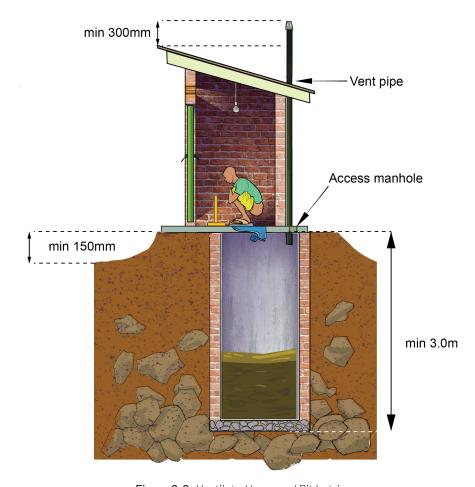
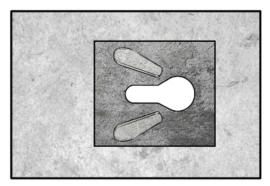


Figure 2-2: Ventilated Improved Pit Latrine

2.4 PRECAST VIP LATRINE

- Prefabrication of components (substructure, superstructure and roof) can be a promising option for cost reduction as it can offer economies of scale. Moreover, prefabrication can be a way to control the material quality and reduce wastage.
- Examples include:
 - · concrete rings (culverts) for lining the pits,
 - · concrete panels for the outer walls of the superstructure or
 - prefab squat pans or toilet seats out of cement or plastic and
 - user interface products such as the SaTo pan and concrete slabs.



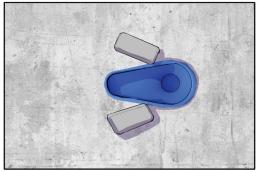




Figure 2-3: Precast Concrete Slabs (left) and Precast Concrete Ring Liners (right)

2.5 WATERBORNE TOILETS

- Waterborne toilets can be Pour Flush Toilet or Cistern Flush Toilet.
- Water closets (WCs) use water to transport human excreta through a drainpipe either to a sewer for offsite treatment or to a septic tank or sewer (where present).
- A typical water borne toilet comprises a superstructure, toilet pans, flushing system, vent pipes, manholes for connecting drainage pipes at junctions and bends and a connection to a conveyance or treatment system.
- Cistern flush use 3 to 15 litres of water per flush while pour flush uses 1.5 to 3 litres.

KEY MINIMUM STANDARDS FOR CISTERN/POUR FLUSH TOILETS

- · Light provision for night use.
- Holder or container for anal cleansing material.
- Cistern require overhead tank for storage of water to be used in flushing and cleaning.
- Discharge wastewater to: (i) sewer, (ii) septic tank or (iii) emptiable lined pit.

| Superstructure/room details: | |
|------------------------------|-------------|
| Floor internal dimensions: | 1.0m x 1.5m |

| Flushing water (litres per person per day) | | | |
|--|-----|--|--|
| Cistern flush | 10 | | |
| Pour flush | 1.5 | | |

| Water use per flushing event (litres) | | |
|---------------------------------------|----------|--|
| Cistern flush | 3 to 15 | |
| Pour flush | 1.5 to 3 | |

| Pan/ bowl details: | | |
|--|--|--|
| Dimensions: Shape: Rear outlet angle with bottom slope towards the back. Water seal depth Minimum outlet pipe diameter Minimum discharge pipe diameter Pipe slope for self-cleaning velocities | 450mm long and 200mm wide oval or pearshaped 25 – 30 degrees minimum of 20mm 70mm 100mm 1:30 | |

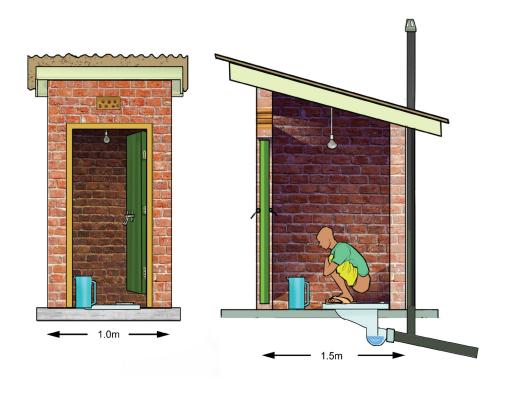


Figure 2-4: Pour Flush Toilet and Cistern Flush Toilet

2.6 SEPTIC TANK

KEY MINIMUM STANDARDS FOR SEPTIC TANK

- Should comprise 2 underground water tight compartments/chambers
- The first chamber is at least twice the size of the second chamber
- Each compartment of a septic tank shall have an access:
 - not less than 455mm by 610mm (rectangular) or
 - opening 500mm diameter (circular).
- Location of septic tank (similar to that of a soak pit)
- Minimum and maximum water depth levels of 1.4m and 2m, respectively.
- A T-shaped outlet pipe to further reduce the amount of scum and solids discharge to soak pit
- The base should be at least 15cm thick concrete.
- Ventilation pipe of at least 50mm diameter fitted with mesh/fly screen
- Emptied at least after 5 years or when sludge fills ones-third of the tank volume, whichever occurs first.
- Media such as gravel, crushed rock, activated carbon can be included in the second chamber.

Location of Manholes leading to septic tank:

- Points of change in direction
- At junctions
- Where there is a change in gradient/grade
- At intervals of ≤50m for very long straight sewer pipes.

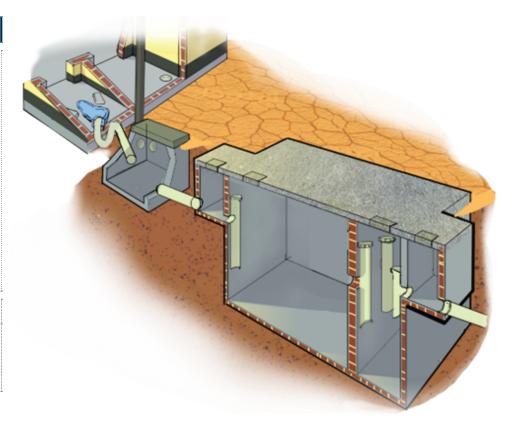


Figure 2-5: Septic Tank

2.7 **SOAK AWAY PIT**

- A soak away is a porous-walled chamber or unlined chamber filled with gravel that allows the septic tank effluent to slowly soak into the ground.
- Gravel packed soak pits are the common practice in Uganda.

KEY MINIMUM STANDARDS FOR SOAK PITS

- Should be kept away from high-traffic areas not to compact the soil above or
- Can be empty or lined with a porous material to provide support and prevent collapse.
- It can be left unlined and filled with course rocks and gravel.
- A layer of sand and fine gravel should be spread across the bottom to help disperse the flow
- A removable cover can be used to seal the pit and allow for future access.
- Not appropriate for areas prone to flooding or that have high groundwater

| Depth | 1.5 to 4 m |
|---|--|
| Location of septic tank and soak away pit | |
| From buildings From water pipes Groundwater table from soak pit bottom Paths/walkways Large trees Cuts/embankments Streams/rivers | 1.5m 3.0m 2m 1.5m 3.0m 30.0m 30.0m |

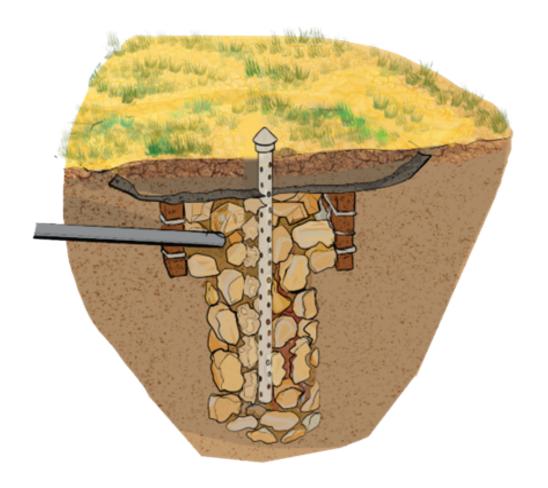


Figure 2-6: Gravel-filled Soak Pit

2.8 DRAINAGE FIELD

• It is a network of perforated pipes that are laid in underground gravel-filled trenches to dissipate the effluent from a septic tank. They require a large area and unsaturated soil with good absorptive capacity to effectively dissipate the effluent, hence are not appropriate for dense urban areas.

KEY MINIMUM STANDARDS FOR DRAINAGE FIELDS

- Each trench is 0.3 to 1.5 m deep and 0.3 to 1 m wide.
- The bottom of each trench is filled with about 15 cm of clean rock and a perforated distribution pipe is laid on top.
- The pipe should be placed at least 15 cm beneath the surface to prevent effluent from surfacing.
- The trenches should be dug no longer than 20 m in length and at least 1 to 2 m apart.
- To prevent contamination, a leach field should be located at least 30m away from any drinking water source.
- A leach field should be laid out such that it will not interfere with a future sewer connection

TWIN PIT POUR FLUSH TOILET 2.9

- The excreta is carried into subsurface leach pits through pipes and one pit is used at a time. The liquid infiltrates into the soil through the holes in the pit lining. The gases also disperse into the soil, and therefore, the provision of a vent pipe for its outlet is not necessary. When one pit is full, the excreta is diverted to the second pit.
- The twin pit pour flush toilet consists of:
 - · A squatting pan
 - · A trap with a 20 mm water seal, to prevent the emission of foul smell and fly / mosquito nuisance
 - Two leaching pits (honey comb lining)
 - · An interconnecting system between pits and trap
 - A superstructure

KEY MINIMUM STANDARDS FOR TWIN POUR FLUSH TOILET

- A toilet can be located inhouse or outside house while the pits are only located outdoors
- · Has access to facilitate emptying services
- Pit should be emptied when contents are within 0.5 m below slab level
- Spacing between pits should be at least equal to effective depth of the pit.
- Impervious barrier (cut-off screen or clay seal) provided between the two pits

| Shape of pits | Circular |
|-----------------|----------|
| Flushing water | 5 litres |
| Number of users | 5 to 15 |

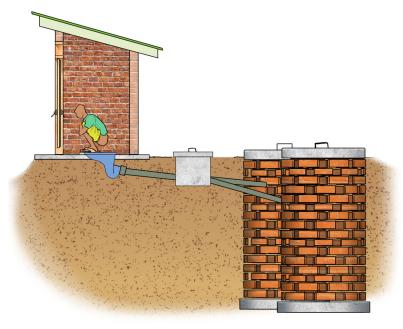
Toilet Location:

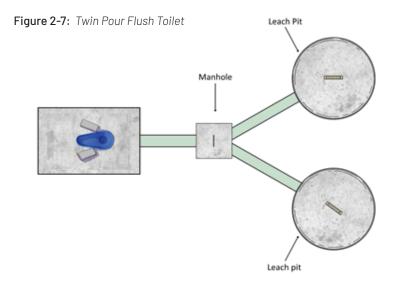
- Not in flooded areas
- Pits under pit located under paths in small spaces

Squatting pan materials:

- Ceramic
- Glass fibre Reinforced Plastics (GRP)
- Cement concrete (CC)
- Poly Propylene (PP) or Poly Vinyl Chloride (PVC)

| Superstructure/room details: | | |
|--|-------------|--|
| Floor internal dimensions: | 1.0m x 1.5m | |
| Height from the floor to underside of ceiling | 2.15m | |
| Door raised from the floor to allow in air | 150mm | |
| Floor level above the surrounding above ground level | Min 150 mm | |
| Door height | 2100 mm | |
| Door width | Min 750 mm | |





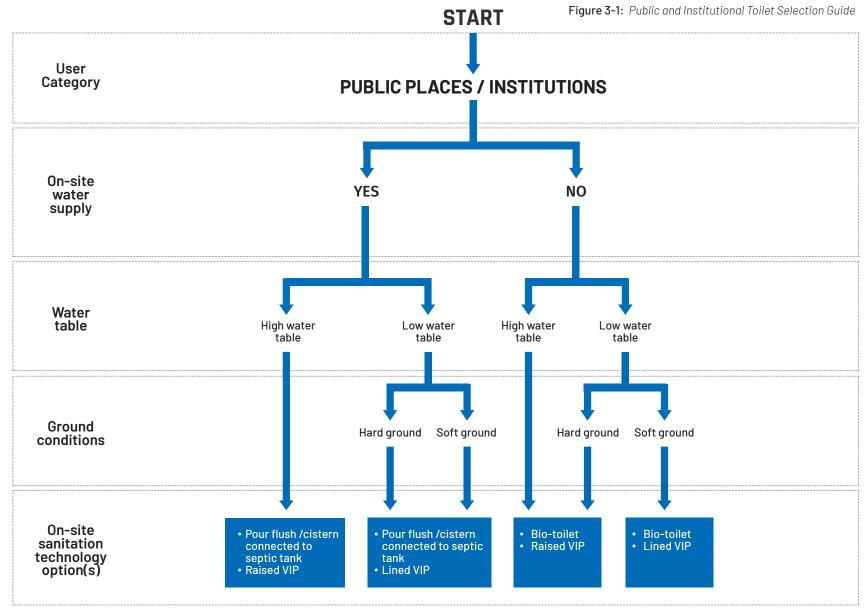
3. PUBLIC AND INSTITUTIONAL TOILETS

This section relates to toilets for public and institutional use such as markets, vehicle parks, recreational parks, offices, churches, mosques and commercial buildings (hotels, hostels, lodging houses, shopping malls and apartment blocks). On the other hand, institutional toilets include facilities used in health centres, prisons and schools (primary and secondary).

3.1 GENERAL REQUIREMENTS

- i. All public and institutional buildings/places can be lined VIP latrines or water borne toilet facilities drained to a septic tank and soak pit within the plot or connected to a sewer system.
- ii. Simple signage prominently displayed indicating EXIT, ENTRANCE, GENDER, as well as stances for PWD and ABLUTION.
- iii. Provisions for persons with disability (PWD) with at least one stance. The PWD should include the following:
 - · Access ramp with a landing.
 - · Hand rails on the ramps.
 - · Interior support rails fixed on the walls and/or floor.
- iv. Provisions for persons with disability with at least one stance reserved for each gender.
- v. Separate toilet stances for male and female.
- vi. Urinals at the boys/male side: minimum is trough urinal.
- vii. Handwashing facility with soap on each toilet block side.
- viii. Toilet areas for each gender should be separated by solid walls (not lightweight partitions) and should have separate entrances.
- ix. Refuse bin in all toilets for females.
- X. Waterborne toilets: Provision for at least 10 liters per person per day for conventional (cistern) flushing toilets and at least 1.5 liters per person per day for pour flush toilets.
- xi. For school toilets:
 - · Separate wash room for girls fitted with disposal or refuse bin and provision for water for cleansing.
 - · Ablution tap or container for schools with washer population of more than 50.
 - One shower for every 20 users in boarding schools.
 - · An incinerator near facilities for girls.

3.2 SELECTION GUIDE



3.3 LINED VIP LATRINES FOR INSTITUTIONS AND PUBLIC PLACES

KEY MINIMUM STANDARDS FOR VIP LATRINE FOR INSTITUTIONS AND PUBLIC PLACES

- Has access to facilitate emptying services
- Pit should be emptied when contents are within 0.5 m below slab level
- · Light for night use
- Drop hole: Key shape of min size 380mm long and 180mm wide at the back and 100mm at front end

Separate washroom for girls/ladies with the following:

- fitted with disposal/refuse bin
- · provision of water for cleaning

Vent pipe details - Lined pit considerations - Superstructure/room details

· Refer to Household VIP details

SCHOOL LATRINES

- Separate blocks for boys, girls and teachers
- Girls' latrine block with Washroom / bathroom/ Menstrual Hygiene Management (MHM) room
- A local incinerator for MHM
- At least one stance for PWD on each latrine block
- Boys block with urinals (Trench urinals in VIP latrine)
- Handwashing facility with soap (group HWF as minimum) at Girls and Boys
 side.

Min size: 1.5 by 2.5 m

| STANCE RATIO | | |
|---|--------------|--|
| Boys / Girls block (Without Urinals): Up to 100 users More than 100 users | 1:25 1:40 | |
| Boys' latrines (With Urinals): Up to 100 users More than 100 users | 1:50 1:80 | |



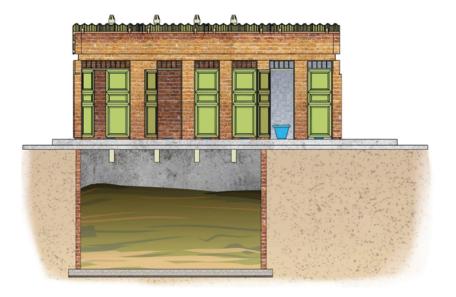


Figure 3-2: Top: School VIP latrines – Girls' Block (with PWD, Bathroom and Incinerator) Bottom: VIP latrine Block for Health Centres – Maternity Wing (with PWD and bathrooms)

WATER CLOSETS/FLUSHING TOILETS FOR PUBLIC PLACES

KEY MINIMUM STANDARDS FOR PUBLIC TOILETS

| Min of 2 Stances | for female | es and 2 Stance | s for Males |
|------------------|------------|-----------------|-------------|
| | | | |

- Holder or container for anal cleansing material
- Discharge to sewer (where available) or to septic tank
- 1 shower facility for females and males each
- Double hooks (for hanging) fixed behind cubical doors
- Ablution tap coupled with hose and a spring-loaded nozzle in at least 1 stance per sex
- Floor trap in stances with the ablution tap and flooring should drain towards floor trap.
- One stance for 100 users per day for public places such as markets and parking areas.
- Standby attendant and cleaning at 3-hour intervals if more than 200 users per stance.
- A hand washing facility with soap for each side (male and female)
- Windows clear enough to provide day light
- Raised water storage tank with a capacity of at least 1000 litres
- · Access road of minimum 4.0m width to facilitate septic tank emptying with a vacuum truck
- Signage with visible and legible directions to toilet location
- Should face public areas such as footpaths, roads, or places of high human traffic
- Space for an operator to sit
- All pipe work and cables should be concealed
- Tiled walls (up to 1.5m above floor level in toilets and 2.0m in bathing rooms) and painted walls
- · Sanitary disposal units for each female unit: clean, with a no touch lid, lined with removable polythene bag
- Rubbish bin: clean, with a "no touch" lid, lined with polythene for safe removal of garbage
- Use of low-cost energy/electric power fixes
- · Cubicle doors lockable from the inside.

| Sı | uperstructure/room details: | |
|----|--------------------------------------|--------------|
| | Room internal dimensions | 1.0m x 1.5m |
| | Persons with Disability (PWD) Stance | 1.5m x 2.15m |

| Provide access ramps with: | | |
|--|----------|--|
| Width | 1.5m | |
| Slope for spans of maximum 1m | 1:10 | |
| Slope for spans longer than 1m | 1:20 | |
| Slope for slanting grounds at entrance | Max 1:25 | |
| Hand rails of min 0.6m hoight anding 0.3m from both ands of the ramp | | |

- Hand rails of min 0.6m height ending 0.3m from both ends of the ramp
- Hard and nonslip surface
- · Landing of minimum 1.3m wide by 1.3m long at every 10m, change of direction and bottom of ramp

Provide Urinals for Males

- 100 Users: Provide 1.0m length trough urinal or one single bowl
- 200 Users: Provide 1.9m length trough urinal or 2 Singles
- 300 Users: Provide 2.85m length trough urinal or 3 Singles.

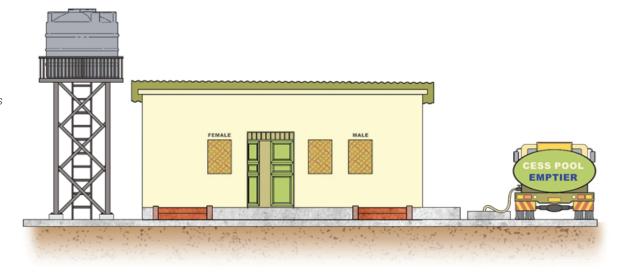


Figure 3-3: Waterborne Public Toilets

PUBLIC WATER CLOSETS/FLUSHING TOILETS FOR SCHOOLS

KEY MINIMUM STANDARDS FOR SCHOOL TOILETS

- Separate stances for boys, girls and teachers
- Holder or container for anal cleansing material
- Hygienic to use and easy to clean
- 1 shower facility for girls with soap, water and basin
- A hand washing facility with soap for each side (girls and
- · At least a wheel chair disabled facility
- Sufficient ventilation and lighting
- Raised water storage tank with a capacity of at least 2500
- Access road of minimum 4.0m width to facilitate septic tank emptying with a vacuum truck
- Signage with visible and legible directions to toilet location
- Gutters for all roofs for stormwater management
- A local incinerator for collecting and burning sanitary
- All pipe work and cables should be concealed
- Tiled walls (up to 1.5m above floor level in toilets and 2.0m in bathing rooms) and painted walls
- Sanitary disposal units for each female unit: clean, with a no touch lid, lined with removable polythene bag
- Rubbish bin: clean, with a "no touch" lid, lined with polythene for safe removal of garbage
- Use of low-cost energy/electric power fixes
- · Cubicle doors lockable from the inside.
- Cistern or pour flushing system
- Pupil to Stance ratio of 1:40



Figure 3-4: School Pour-flush toilet

3.6 HANDWASHING FACILITIES

KEY MINIMUM STANDARDS FOR HANDWASHING FACILITIES

- · Should be installed outside the toilets for common use by all users, especially for public toilets
- The wash basin in toilets for PWD should be within reach from a seated position so that one can use it without standing up.
- Recommended heights: high sink of 0.8m or low sink of 0.4m for crawling PWD children
- Convenient handwashing facilities at less than 5m from toilets
- Allow proper drainage of wastewater

For wash basins:

- Minimum size of 500mm in length and 400mm in width.
- For 2 or more basins in public places, one should be installed at child's height

For schools:

- Group handwashing facilities such as WASHaLOT 3.0 can be adopted.
- Handwashing points to student ratio is 1:40
- · Located in most convenient places such as toilets, kitchen and classrooms

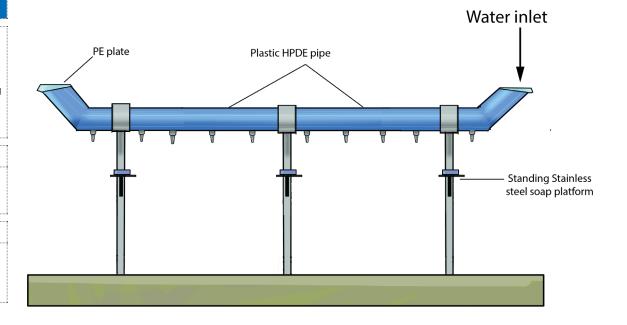


Figure 3-5: WASHaLOT 3.0 Handwashing Facility

3.7 INCINERATOR

KEY MINIMUM STANDARDS FOR INCINERATORS

- Every school is required to have at least an incinerator
 Minimum height of chimney is 1.5 m
- Operational temperature of at least 600oC to avoid emitting excess hazardous gases.

Site location Consideration:

- A flat, open terrain is desirable. Not in areas with tall trees and vegetation to prevent smoke disappearance.
- Not near populated areas, such as residential, markets, etc.
- Not near agricultural areas, such as leafy vegetables and animal feeds
- At least 30 m from nearest building and storage areas holding flammable materials
- Areas of low security risks.
- Away from the prevailing wind direction (always at the back of the facility)

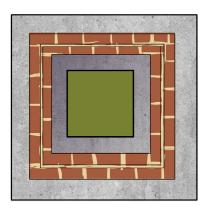
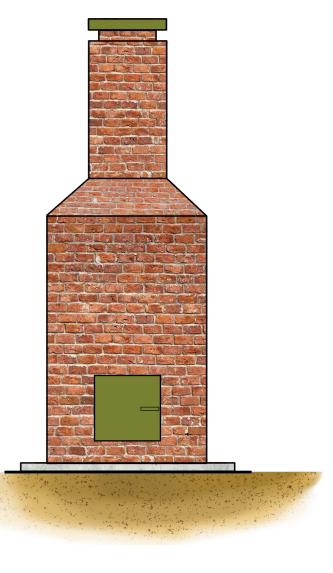


Figure 3-6: Incinerator



3.8 URINALS

KEY MINIMUM STANDARDS:

- May be individual wallmounted units, more than 300mm wide, or as a trough properly graded towards the opposite wall.
- If more than one wallmounted unit provided, one should be child friendly.
- Urinal troughs should be bordered by walls on the left and on the right side.
- Lip of the collection area should project from the wall by at least 250mm.
- A concrete step/landing of at least 325mm could be built in front of the urinal. Between the step and the wall behind should be at least 575mm.
- Distance between urinals 750mm.
- Discharge pipes or urinal channels should be laid at a slope of not less than 1 in 40.

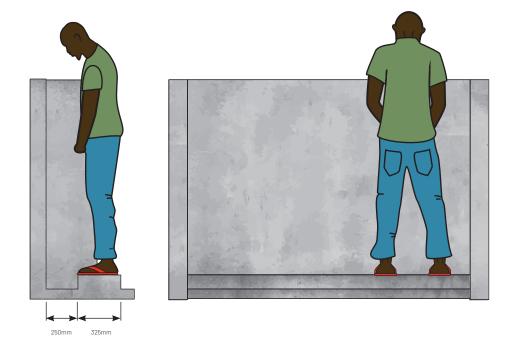
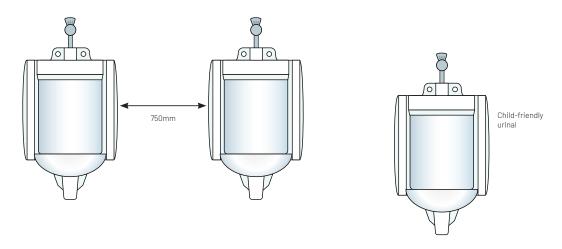


Figure 3-7: Trough and wall-mounted urinals for institutions and public places



OPERATION AND MAINTENANCE OF ONSITE SANITATION FACILITIES

Operation and maintenance should follow standard sanitation and asset management practice in line with O&M guidelines as well as other existing national provisions, such as the Ministry of Education and Sports Handbook for Operation and Maintenance of Water, Sanitation and Hygiene Facilities in Schools in Uganda, Ministry of Health WASH Guidelines (2022).

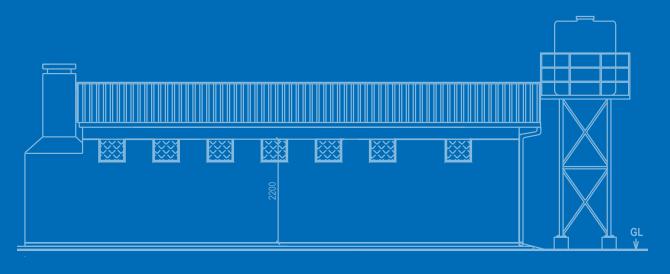
Key provisions include: daily cleaning of facility, immediate repair to structures, safe operation in line with guidelines for each sanitation option.

Table 4-1: Operation and Maintenance of WASH Facilities

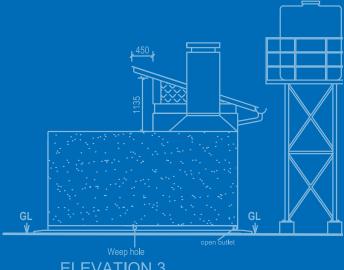
| FACILITY | DAILY OPERATIONS | MONTHLY OPERATIONS | REGULAR MAINTENANCE |
|--|--|--|---|
| Lined VIP latrines and Waterborne toilets | Clean the slab/floor with soap and water Clean the Urinals to avoid staining Check the cleaning schedule to ascertain when and who to clean facility Check for the internal locks on the doors Supply of anal cleansing material Ensure clean handwashing facilities close to the toilet. Check walls for faeces and clean (if any) Ensure clean washroom(s) Refill water tanks (if any) For Sato Pan Interface: Clean the pan after visiting the toilet Use little water (<0.5 litres) and toilet brush | Check superstructure for damage and maintain if at all Check for any damage of vent pipe Check that the latrine or septic tank is not full. Should be emptied when full. Inspect the slab for cracks and holes Presence of functional door that provides privacy Availability of protective gloves and boots for cleaning Slashing around the facilities and clear the access path | Keep toilets functional and prevent them from breakdown and expensive repairs. Simple repair like fixing a door lock or replacing a broken tap should be done immediately. Small tasks, like refilling soap, can easily be performed by students. Regular scheduled maintenance inspection is helpful to prevent major repairs in the future Trained staff for minor repairs Possession of a tool box |

| FACILITY | DAILY OPERATIONS | MONTHLY OPERATIONS | REGULAR MAINTENANCE |
|---------------------------|--|--|---------------------|
| Handwashing facilities | Ensure presence of person(s) responsible for water refilling and cleaning of handwashing facilities. Check on presence of stock for cleaning supplies Presence of water and soap at handwashing stations. Check taps and tanks for breakage Check operation of pedal mechanism or foot pumps Check for obvious smell or high turbidity in water Check if the handwashing facility and its components are visibly clean Check for any stagnant water around the base and drain it. | Check whether soak pit/ drain/ waste bucket is operational. Slashing around the facilities and clear the access path. | |
| Incinerator | Check for evidence of cracks on brickwork Carefully sweep the area around the incinerator Clean tools and equipment Store healthcare wastes in an orderly manner Maintain fuel stock levels | Clean the chimney to remove soot Remove lumps of melted glass/plastic and clean grate Reinstall grit after cleaning Check cement seal to bricks Perform simple repairs Inspect and replace metal parts, bricks and consumable parts Check status of the ash pit. | |















THE REPUBLIC OF UGANDA MINISTRY OF WATER AND ENVIRONMENT

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