

MINIMUM STANDARDS FOR ONSITE SANITATION TECHNOLOGY OPTIONS IN KAMPALA

KAMPALA CAPITAL CITY AUTHORITY
PUBLIC HEALTH AND ENVIRONMENT DIRECTORATE

**MINIMUM STANDARDS FOR ONSITE SANITATION
TECHNOLOGY OPTIONS IN KAMPALA**

First Edition

These standards have been developed by the Directorate for Public Health and Environment KCCA in a consultative manner with inputs from user communities, various KCCA Directorates, Uganda National Action on Physical Disability (UNAPD), and other relevant stakeholders. All reasonable precaution has been taken to ensure the accuracy of information contained in this document.

Supported by:



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LIST OF ACRONYMS

C&T	Collection and transport
CSOs	Civil Society Organisations
FGDs	Focus group discussions
FS	Faecal sludge
FSM	Faecal sludge management
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HH	Household
HWF	Hand washing facility
KCCA	Kampala Capital City Authority
MCA	Multi-criteria analysis
NEMA	National Environment Management Authority
NGO	Non-governmental organisation
O & M	Operation and maintenance
PWD	People with disabilities
RRR	Resource Recovery and Safe Reuse
RUWASS	Reform of the Urban Water and Sanitation Sector
SDGs	Sustainable Development Goals
UDDT	Urine Diversion Dehydrating Toilet
UNAPD	Uganda National Action on Physical Disability
VIP	Ventilated Improved Pit Latrine
WCs	Water closets
WHO	World Health Organisation
WSTF	Water Services Trust Fund

Preface



BACKGROUND AND OBJECTIVES

Availability of adequate sanitation services is one of the most significant development challenges experienced in the rapidly growing Kampala city. Recent studies by KCCA affirm that 90% of Kampala's population relies on on-site sanitation. The on-site technologies, as confirmed by the 2016 inventories of division community toilets, include flush (pour and cistern) toilets, Urine Diversion Dehydrating Toilets (UDDTs), Ventilated Improved Pit Latrines (VIPs) and traditional pit latrines.

The toilets are put up by individuals and different institutions with no proper guidance to inform planning, construction and enforcement. Current practice involves relying on the expertise and experience to define what qualifies as an acceptable toilet facility. Legal provisions broadly define the requirement for a sanitation facility and some guidelines are inconsistent with each other. Notably the requirement of all buildings to be connected to sewer and toilet stance dimensions for people with as contained in the accessibility standards by UNAPD and other guidelines.

The Sustainable Development Goals (SDGs) define adequate sanitation to include safe excreta management and hand washing; as such all toilets must have provisions for proper emptying and / or treatment of faecal sludge as well as a hand washing facility. In the absence of explicit legal provisions and consistent sanitation guidelines for, amongst others, having emptyable toilets, the need for minimum standards is apparent.

KCCA's current drive towards improving faecal sludge management in Kampala is cognisant of the city sanitation challenges and significant contribution of sanitation to economic and social development of the country and thus its citizens. The Authority and its divisions have an intermediary function for the coordination of sanitation planning and the harmonisation with urban development planning.

This document therefore is intended to assist households, developers and KCCA to define the minimum standards for on-site sanitation technology options that can be adopted in Kampala city. It will provide enforcement guidance to KCCA and assist to improve FSM in the city.

These standards are derived from the provisions in existing legislation and guidelines related to sanitation in Uganda. They incorporate current faecal sludge management practice in the different KCCA divisions and best practice in similar contexts. Chapter 1 provides the basis and overview of the standards, chapter 2 and chapter 3 provide minimum standards for household and public on-site latrine options respectively. Chapter 4 focuses on details relevant to add-ons like septic tanks and toilet accessories; Annexes with technical details of the different options form the last section.

This first edition will continue to serve as a guiding document that will be continually refined building on field user and/ or stakeholder experiences. These minimum standards should be read in conjunction with available technical standards of building construction, operation and maintenance guides as well as legal requirements in Uganda relating to sanitation, physical planning, environment protection and engineering works.

In the absence of explicit legal provisions and consistent sanitation guidelines, the need for minimum standards is apparent.

Minimum Standards - The Basis

1.1 POLICY PROVISIONS

Law/Regulations	Provisions relevant to on-site sanitation
Public Health Act 1935 (Cap.281) (revised in 2000)	<ul style="list-style-type: none">» Mandates the Local Authority to safeguard and promote public health (Part II, Section 5).» Requires all dwellings to have functional sanitation facilities that meet minimum standards (Part X, Sections 84-86 and 88-89).» All buildings to be erected on plots with proper and sufficient access to a road or road reserve (S.I 281-1, Part III, 26-29).» KCCA is mandated to enforce rules in the Public Health Act (Part IX, 15).
The Local Government Act 1997 (Cap.243)	<ul style="list-style-type: none">» Allows KCCA to implement and maintain public sanitation facilities, sanitary responsibility for the removal and disposal of night soil (Second Schedule, Part 3, 1 (o and w)).» Enables a Local Authority to make bye-laws for reinforcing existing laws (Part IV, Section 39-1).» Creates opportunities to regulate (e.g. setting operational standards) the FSM business through licensing.
The National Environment (Waste Management) Regulations S.I. No 52/1999	<ul style="list-style-type: none">» Establishes NEMA as mandated institution for licensing persons intending to (i) transport waste (Clause 6, 1) and/or to operate a waste treatment plant or waste disposal site after an EIA study (Clause 13, 1).» Recognizes enforcement as a strategy to minimize public health risks and prevent environmental pollution.
The Kampala Capital City Act, 2010	<ul style="list-style-type: none">» Provides mandate for KCCA to ensure public health and safe sanitation in the communities (Part B, Section 35, 29 (l &s)).» Allows KCCA to enforce ordinances and byelaws made by the Authority (Part III, 19 (s)).» Provides mandate for KCCA to set service delivery standards e.g. for pit latrine construction and emptying services.» Enables KCCA to control infrastructure development in the city.
The Public Private Partnership Act, 2014	<ul style="list-style-type: none">» Enables private sector involvement in faecal sludge management (FSM) in Kampala city including through different private-public partnership arrangements.

Law/Regulations

Provisions relevant to on-site sanitation

The Building Regulations Statutory Instruments 281- 1, 2, 3. 20

- » Provides for approval of drawings including plans and sections of buildings by the Local Authority (S.I. 281: 1-3).
- » Allows KCCA to enforce compliance by whoever is to erect a school (S.I. 281-20).

The Physical Planning Act, 2010

- » Provides for the making and approval of physical development plans by the Local Authority and for the applications for development permission.

National Physical Planning Standards and Guidelines, 2011

- » Provides guidelines on toilet and septic tank standards as well as planning guidelines for dwellings and public places.

Building Control Regulations and Schedule 22

- » Provides guidance on standards for sanitation technology options and latrine accommodation.

1.2 GENERAL REQUIREMENTS

Each on-site sanitation technology should:

- i. Be emptiable
- ii. Have a hand washing facility with soap
- iii. Have anal cleansing materials
- iv. Allow for privacy of users including having a lockable door
- v. Allow for inclusiveness e.g. provisions for people with disabilities (PWD) and for menstrual hygiene management
- vi. Have a durable and sturdy superstructure
- vii. Be secure – safety for night use and from intrusion
- viii. Be well ventilated and have adequate lighting especially for night use
- ix. Be kept clean and hygienic; have minimal odor
- x. Have a provision for access to a pit emptier.

1.3 PROVISIONS FOR PEOPLE WITH DISABILITY (PWDs)

- i. Room/stance floor dimensions –
- ii. Door – 0.9m wide with a pull handle for closing
- iii. Toilet seat height – 0.48m from finished floor surface
- iv. Hand rails - diameter of 32mm to 38mm fitted at back and wall next to toilet seat; upper rails at 0.84m to 0.92m height and lower rails at 0.55m
- v. Two separate sinks at different heights – high sink at 0.8m and low sink at 0.4m
- vi. Urinals floor surface - 1.5m x 0.8m to allow wheel chair approach

1.4 CONSTRUCTION SPECIFICATIONS

- i. Mortar (mix of cement and sand) - Minimum ratio of 1:4
- ii. Concrete – Minimum mix ratio of 1 cement:3 sand:6 aggregate
- iii. Walling – Burnt clay brick wall with 150mm minimum thickness

1.5 OPERATION AND MAINTENANCE REQUIREMENTS

Operation and maintenance should follow standard sanitation and asset management practice in line with KCCA 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. Key provisions include: daily cleaning of facility, immediate repair to structures, safe operation in line with guidelines for each sanitation option.

1.6 MENU OF SANITATION OPTIONS

The technological options presented in this guideline are mainly limited to containment and these include:

<p>Water borne toilets for household and public users</p>	<p>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 a bio-treatment unit for onsite treatment. A typical water borne toilet comprises a superstructure, toilet pans, flushing system, and vent pipes for aeration to prevent foul smell, manholes for connecting drainage pipes at junctions and bends and a connection to a conveyance or treatment system. In public places, the squatting option and pedal flushing system are preferred to minimize disease transmission and also for ease of cleaning.</p> <p>a. Cistern flush – these are modern type and the most preferred sanitation facilities due to their comfort. The flushing system includes a cistern/holding tank in the toilet with use of 3 to 15 litres of water per toilet flush depending on the age and design of the toilet. Operation can either be pedal or hand operated. The bowl contains a water seal that helps prevent odours.</p> <p>b. Pour flush – This is similar to the cistern flush but with no holding tank. Flushing is done manually by pouring water directly into the toilet pan. It uses less water compared to the cistern option, about 2 to 3 litres of water are usually sufficient for a flush.</p>
<p>Ventilated Improved Pit Latrine (VIP)</p>	<p>The lined Ventilated Improved Pit Latrine (VIP) is a dry toilet comprising 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 the pit when full. The main features of a lined VIP are: a superstructure, lined substructure or pit, vent pipe, slab and provision for pit emptying.</p>
<p>Urine Diversion Dehydrating Toilets (UDDTs)</p>	<p>Urine Diverting Dehydrating Toilets (UDDTs) are an ecological sanitation toilet option which involves separation of urine from faeces and operates on principle of waste sanitization for re-use. UDDTs are only recommended for use by households because of the operation and maintenance requirements for its proper functioning. A typical UDDT consists of: A toilet superstructure, toilet seat or squatting pan, two collection chambers for double vault systems, a ventilation pipe to aerate the collection chamber and a urine pipe connected to a soakaway or a collection container. UDDTs, though not popular, are an option for consideration.</p>
<p>Bio-latrines</p>	<p>Bio-latrines are a form of water borne toilet that promotes resource recovery and reuse as the toilet block is connected to anaerobic digesters which produce biogas that can be used for lighting and cooking. In addition, the digestate can be used as a soil conditioner. The main features of bio-latrines are: toilet block, bio-digester chamber, expansion chamber, slurry collection tank and gas tapping unit. Currently bio-toilets are being promoted at schools, given the high FS generation rates and demand for cooking gas.</p>

Household Toilets

The background features a dark green vertical bar on the left side. The rest of the background is a lighter green color, overlaid with several large, organic, rounded shapes in the same dark green color, creating a layered, abstract effect.

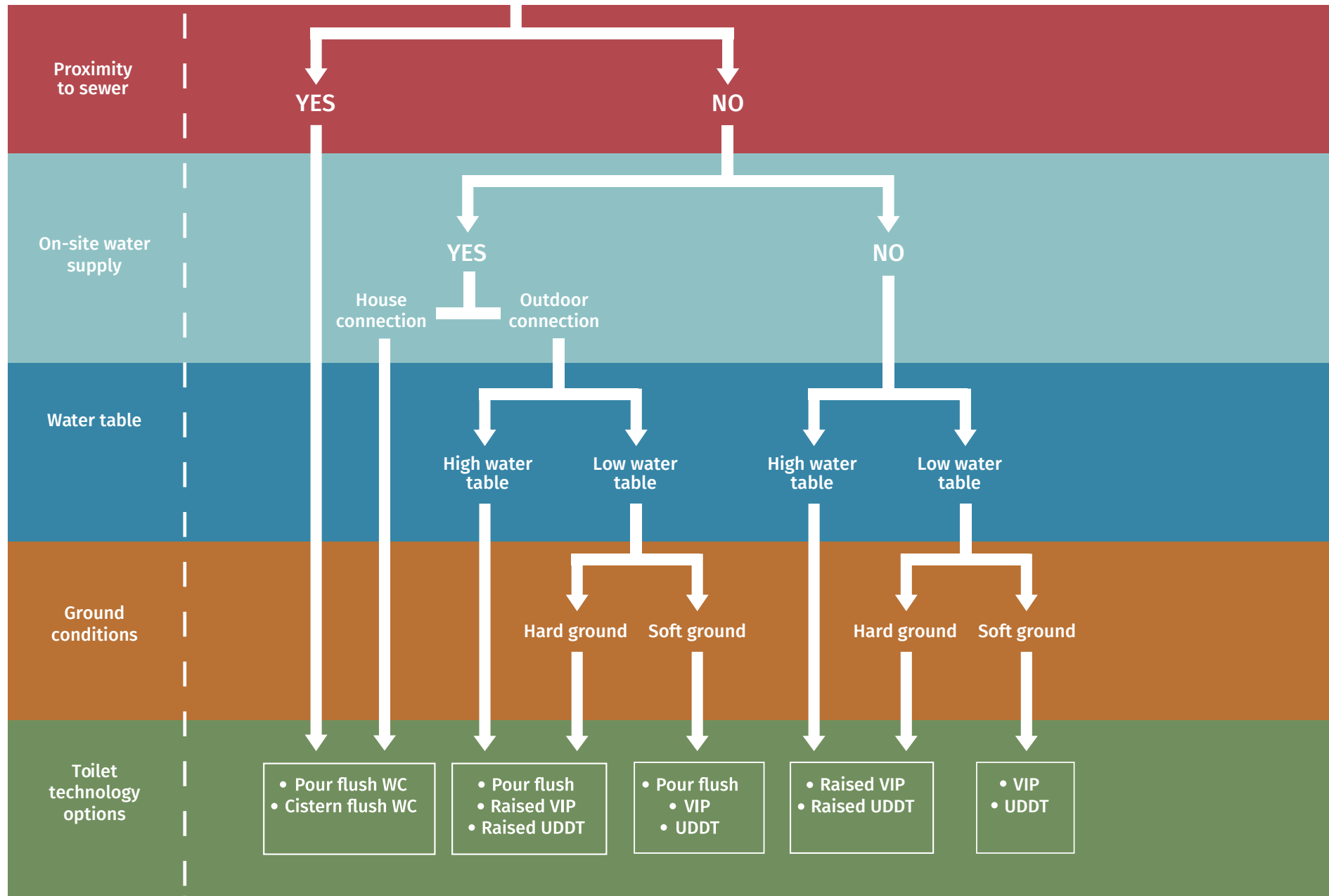
2.1 SELECTION GUIDE

The selection of appropriate sanitation technological options is often an iterative process involving multi-criteria analysis of key composite factors either through multistakeholder engagements, computer aided systems and or expert opinions. 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.

This standard adopts three basic key criteria in the proposed simplified decision support framework below for minimum on-site containment options. These include availability of water supply, water table level and ground conditions. The menu of options for household toilets includes the cistern flush toilet, pour flush toilet, Ventilated Improved Pit Latrines and Urine Diversion Dry Toilet (UDDT).

START

FIGURE 2-1 HOUSEHOLD TOILET SELECTION GUIDE



2.2 STANDARDS FOR DIFFERENT TOILET OPTIONS

2.2.1 Wet Toilet Options

2.2.1.1 Cistern Flush Toilets

Key Minimum Standards

- i. **Room:** 1.0m x 1.5m internal dimensions.
- ii. Connection to water supply system – minimum 10 litres per person per day for flushing.
- iii. Light for night use
- iv. Holder or container for anal cleansing material
- v. Discharge to sewer, septic tank or emptiable bio-pit

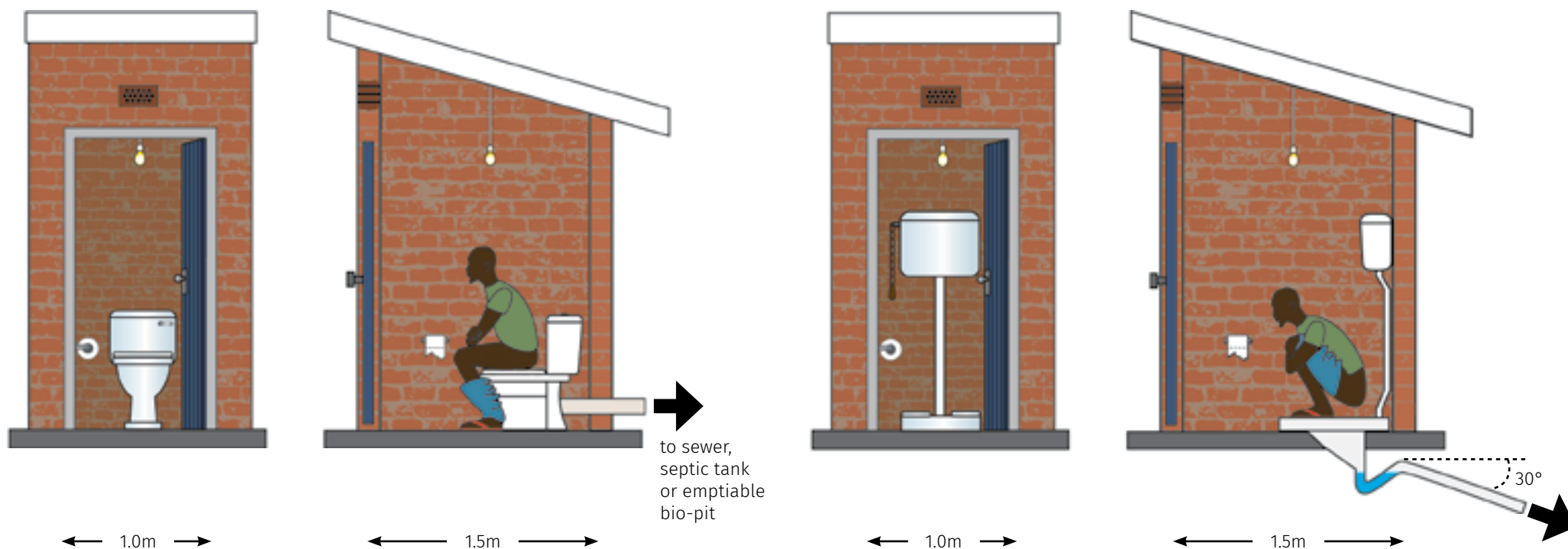


FIGURE 2-2 CISTERN FLUSH TOILET OPTIONS

2.2.1.2 Pour Flush Toilets

Key Minimum Standards

- i. Room: 1.0m x 1.5m internal dimensions.
- ii. 1.5 litres of water per person per day for flushing
- iii. Pan/ bowl :
 - Dimensions - 450mm long and 200mm wide and oval or pear-shaped.
 - Rear outlet with 25 – 30 degrees bottom slope towards the back.
 - Water seal depth of minimum of 20mm and an outlet of a minimum 70mm diameter.
 - Discharge pipe: minimum 75mm diameter fitted at a slope of 1:30 to be self-cleaning
- iv. Light for night use
- v. Holder or container for anal cleansing material
- vi. Discharge to sewer, septic tank or emptiable bio-pit

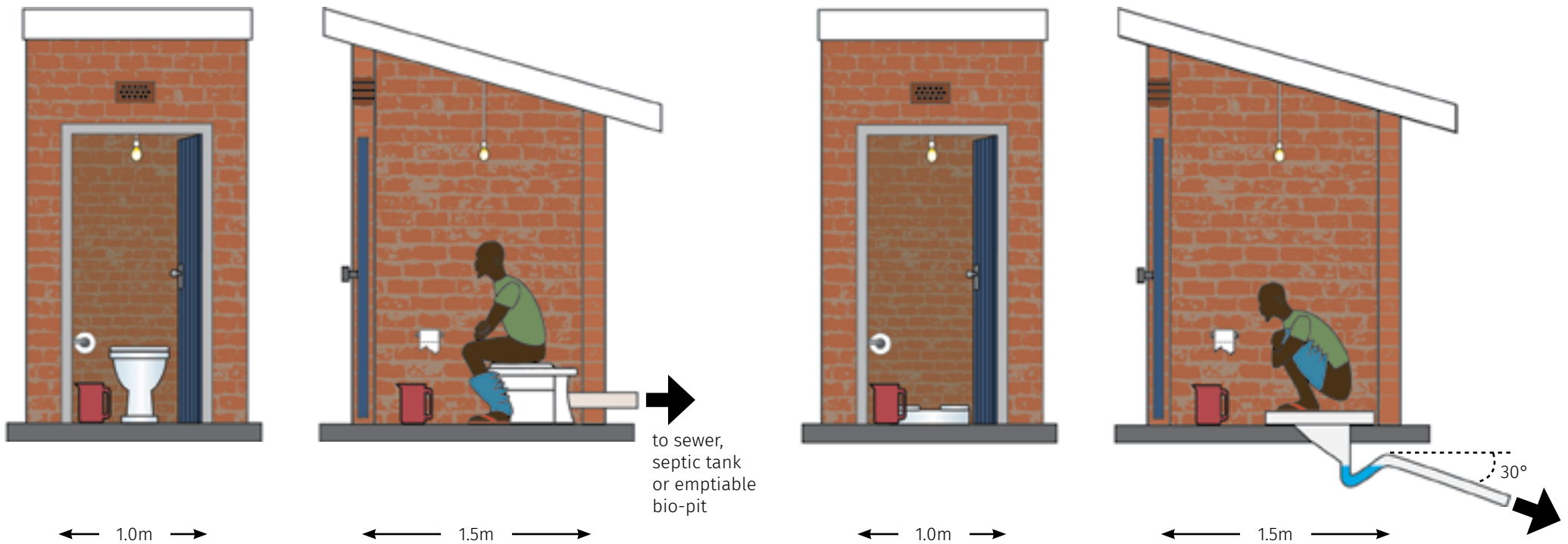


FIGURE 2-3 POUR FLUSH TOILET OPTIONS

2.2.2 Dry Toilet Options

2.2.2.1 Ventilated Improved Pit Latrine (VIP)

Key Minimum Standards

- i. Minimum distance from any habitable room/kitchen/food stores - 10m
- ii. Located minimum 1.5m from any plot boundary
- iii. A stance to user ratio of maximum 1:5
- iv. Superstructure/room:
 - Floor internal dimensions: 1.0m x 1.5m
 - Height: 2.15m from the floor to underside of ceiling
 - Burnt brick walling: flush pointed internal and external finishes
 - Door raised (50mm) from the floor to allow in air
- v. Slab: reinforced 50mm thick concrete
- vi. Floor level shall be at least 150mm above the surrounding ground level
- vii. Drop hole: not larger than 250mm at largest opening (for child safety)
- viii. Squat hole cover to help control flies and odour
- ix. Light for night use
- x. Holder or container for anal cleansing material
- xi. Pit for household of 5-7:
 - Fully lined e.g. with burnt clay bricks
 - Minimum internal effective depth of 3.0m and width of 1.2m of the lined pit
 - Bottom should be at least 1.5m above the water table
- xii. Vent pipe:
 - Diameter at least 100mm,
 - Top end at least 300mm above the highest part of the roof to maximize wind into system
 - Fly screen (mesh) at top of vent pipe with openings/holes not larger than 1.5mm square. Mesh material should be corrosion, rain, heat and sunlight resistant
 - Connection to slab should be completely sealed to minimise leakage
- xiii. Access to facilitate pit emptying services
- xiv. Pit should be emptied when contents are within half-a-metre of the soffit (underside) of the cover slab

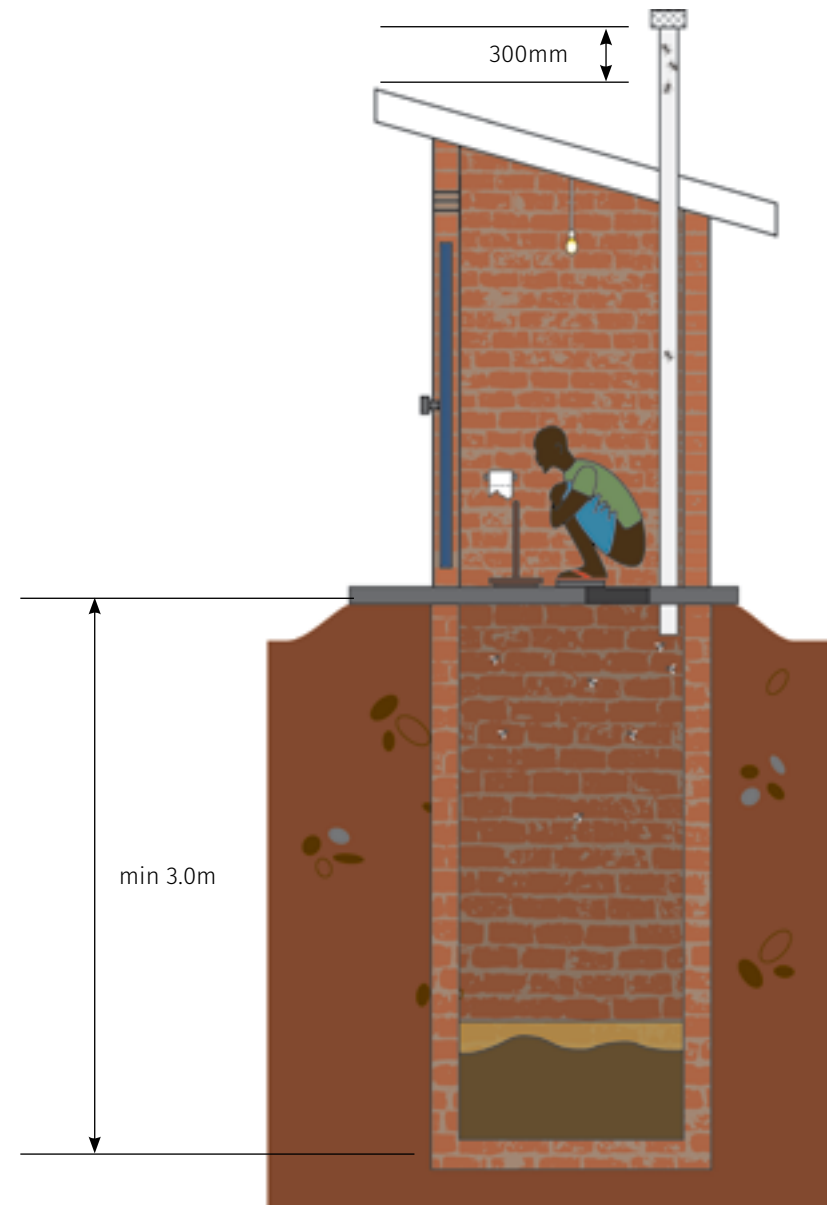


FIGURE 2-4 VENTILATED IMPROVED PIT LATRINE

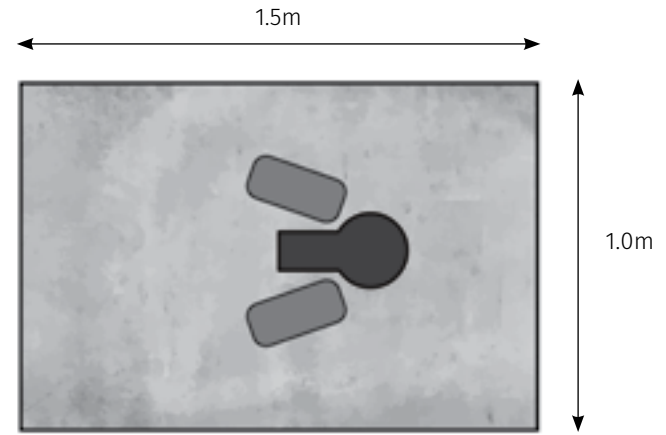


FIGURE 2-5 RAISED VENTILATED IMPROVED PIT LATRINE & INTERIOR DETAILS

Public and School Toilets

The background is a solid dark green. On the right side, there is a large, stylized number '3' in a slightly lighter shade of green. To the right of the '3', there is a white speech bubble shape pointing towards the left. The overall design is clean and modern.

This section relates to toilets for public use and primary school children. Public toilets relate to on-site sanitation options for public places like markets, vehicle parks, offices and commercial buildings.

3.1 MENU OF OPTIONS

Sanitation options for this category of users are similar to the ones for households except for the Ecosan (UDDT) toilet that has not been a successful public sanitation option due to poor O&M. In addition to the household options this category includes bio-toilets, which are being promoted in line with the resource recovery strategy for proper faecal sludge management in the city.

See process chart on p.24

3.2 GENERAL REQUIREMENTS

1. All commercial buildings must have water-borne toilet facilities drained to a septic tank and soak pit within the plot or connected to a sewer system
2. Simple signage prominently displayed indicating EXIT, ENTRANCE, GENDER, as well as stances for PWD and ablution
3. Provisions for persons with disability with at least one stance reserved for each gender
4. Separate toilet blocks for male and female
5. Hand washing facility with soap on each toilet block side
6. Toilet areas for each gender should be separated by solid walls (not lightweight partitions) and should have separate entrances
7. Refuse bin in all toilets for females
8. Provision for at least 10 litres per person per day for conventional flushing toilets and at least 1.5 litres per person per day for pour flush toilets
9. For school toilets
 - Separate wash room for adolescent 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 20 every users in boarding schools

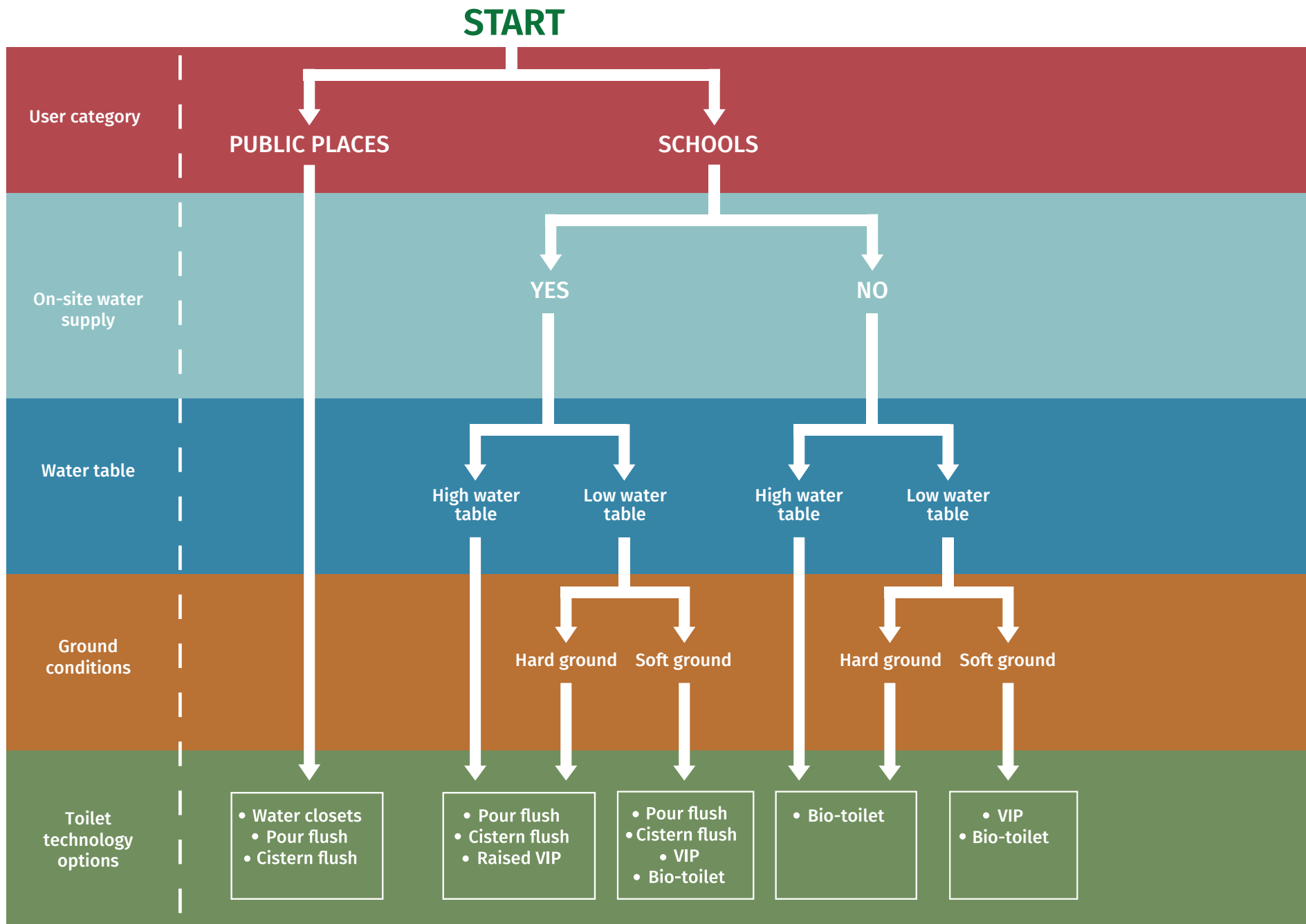


FIGURE 3-1 SCHOOL AND PUBLIC TOILET SELECTION GUIDE

3.3 STANDARDS FOR DIFFERENT TOILET OPTIONS

3.3.1 School VIP

Key Minimum Standards

- i. Stance accomodation: separate facilities for boys and girls

No. of Users - Boys/Girls (without Urinal)	Stance Ratio
Up to 100	1: 25
More than 100	1: 40

TABLE 3-1 SCHOOL VIP STANCE

No. of Users (Boys)	Stance Ratio (with Urinal)	Urinals
Up to 100	1: 50	1
More than 100	1: 80	1 per 100

- ii. Drop hole: keyhole shape – 380mm long and 180mm wide at back and 100mm at front end
- iii. Separate wash room for adolescent girls fitted with disposal or refuse bin and provision for water for cleansing
- iv. **For individual rooms/stances the same standards as for Household VIPs apply.**

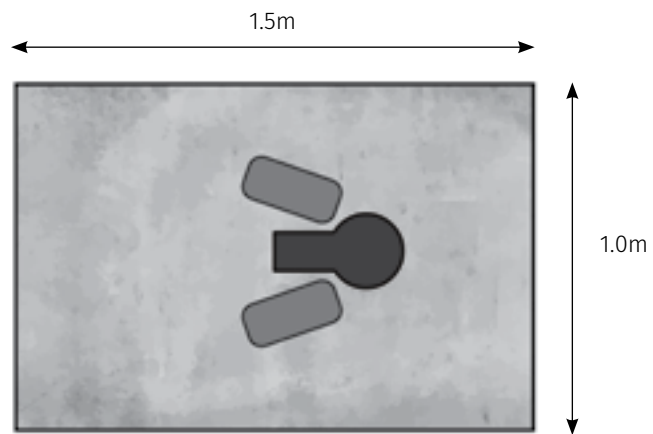
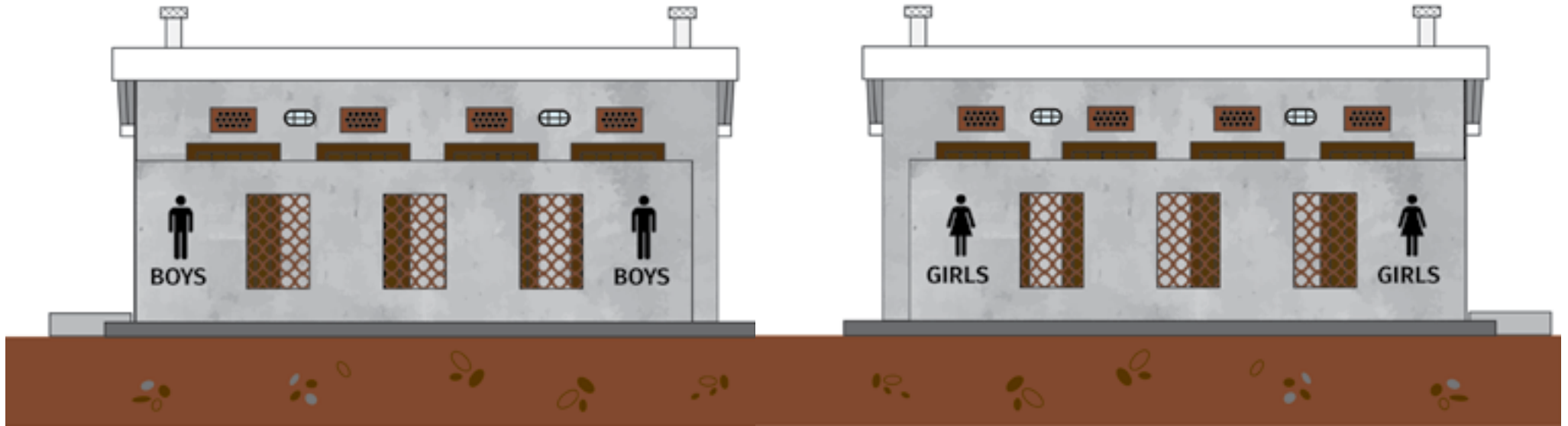


FIGURE 3-2 SCHOOL VIP TOILETS

3.3.2 Bio-Latrine for Institutions

Key Minimum Standards

Bio-latrines should preferably be located in areas of firm but sloping ground to allow the slurry generated to flow through the unit by gravity.

- i. Minimum land area: 20m x 15m
- ii. Maximum stance to user ratio: 1:40
- iii. Bio-digester
 - should be built at least 0.3m below the floor of the toilets
 - Well lined to avoid escape of gas.

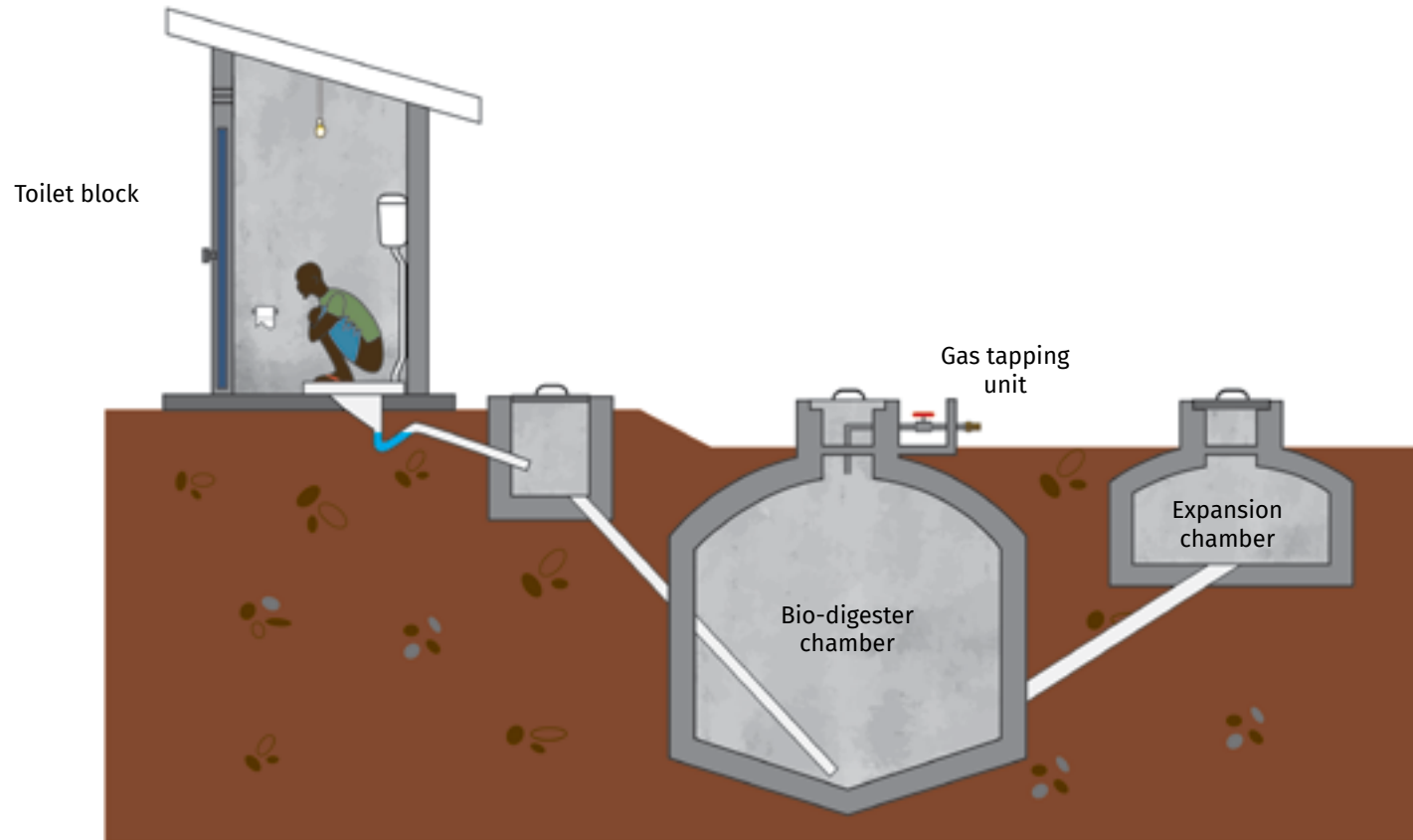


FIGURE 3-3 BIO-LATRINE FOR INSTITUTIONS

3.3.3 School Water Closets

Key Minimum Standards

- i. Floor dimensions: 1.0m by 1.5m and 1.8m by 1.8m for PWD stances
- ii. Floor trap in stances with the ablution facility and flooring should drain towards floor trap to avoid wet floors
- iii. Raised water storage tank with a capacity of at least 2500 litres
- iv. All pipe work and cables should be concealed

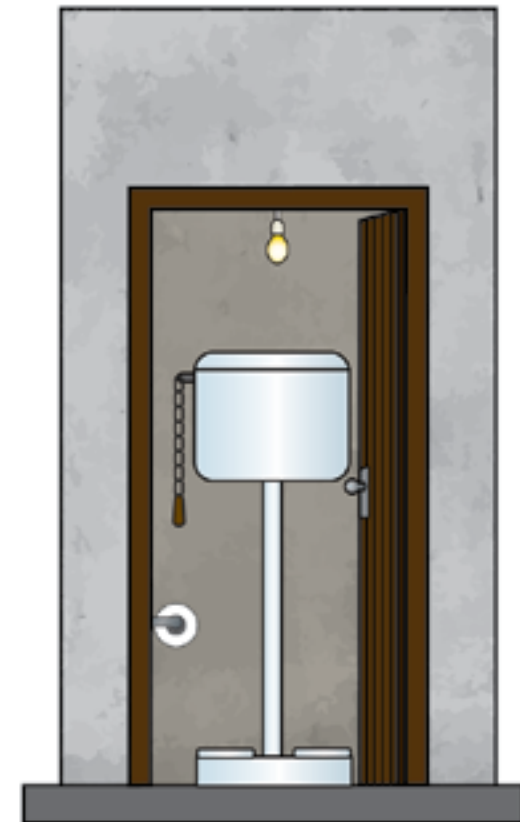
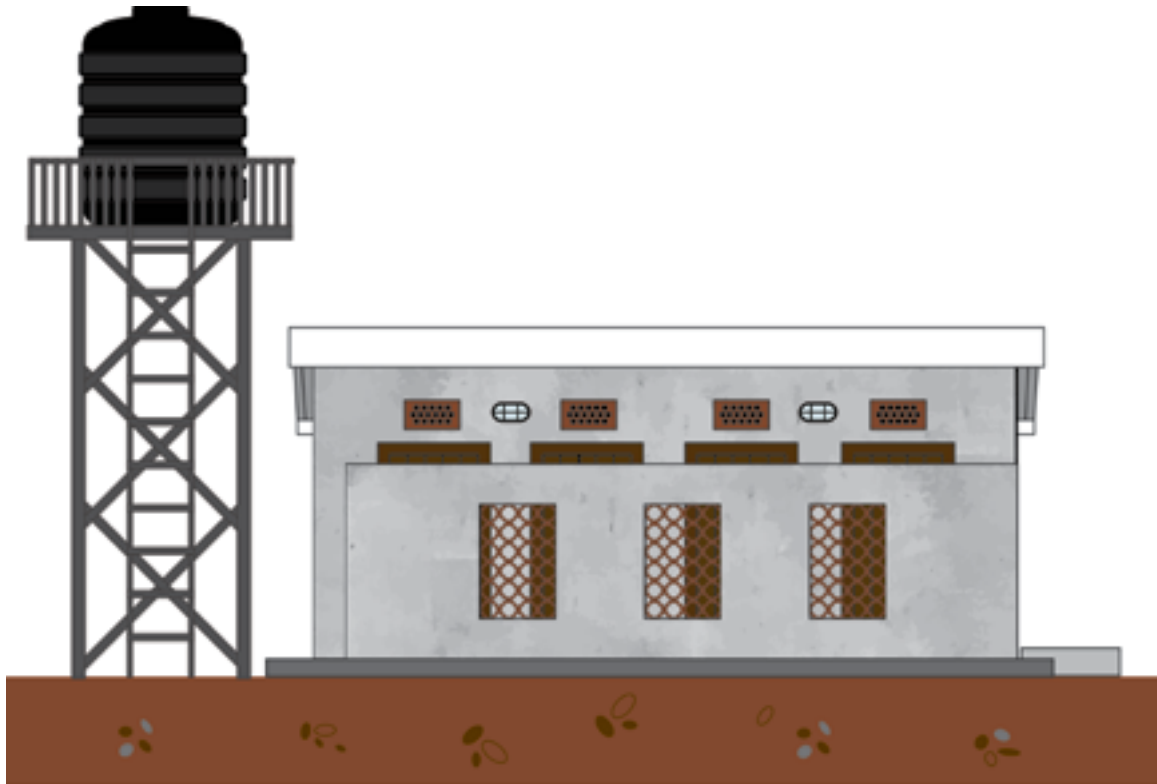


FIGURE 3-4 SCHOOL WC TOILET BLOCK AND STAND INTERIOR

3.3.4 Public Latrines – Water Closets/Flushing Toilets

Key Minimum Standards

- i. Toilet stances:
 - 2 stances for females and 2 stances for males
 - Floor dimensions: 1.0m by 1.5m and 1.5m by 1.5m for PWD stances
- ii. 1 shower facility for females and males each
- iii. Double hooks (for hanging) fixed behind cubicle doors
- iv. Ablution tap coupled with hose and a spring-loaded nozzle in at least 1 stance each for male and female
- v. Floor trap in stances with the abluion tap and flooring should drain towards floor trap so as to keep the floor as dry as possible
- vi. Design rule of thumb: one stance for 100 users per day for public places such as markets and parking areas
- vii. Standby attendant and cleaning at 3 hour intervals if more than 200 users per stance
- viii. Urinals for males:
- ix. If 2 or more urinals are installed, one should be installed at child’s height
- x. A hand washing facility with soap for each side (male and female)
- xi. A fence with a lockable gate
- xii. Windows clear enough to provide day light
- xiii. Raised water storage tank with a capacity of at least 2500 litres
- xiv. Provide ramps with:
 - At least 1.3m width with a slope not exceeding 1:10 for spans of maximum 1.0m and 1:20 for longer spans. For slanting grounds at entrance, maximum slope of 1:25 is acceptable
 - Hand rails of min 0.6m height ending 0.3m from both ends of the ramp
 - Hard and non-slip surface
 - landing of minimum 1.3m wide by 1.3m long at every 10m, change of direction and bottom of ramp
- xv. Access road of minimum 4.0m width to facilitate septic tank emptying with a vacuum truck in non-sewered areas
- xvi. Signage with visible and legible directions to toilet location
- xvii. Should face public areas such as footpaths, roads, or places of high human traffic
- xviii. Space for an operator to sit
- xix. All pipe work and cables should be concealed
- xx. Tiled walls (up to 1.5m above floor level in toilets and 2.0m in bathing rooms) and painted walls
- xxi. Sanitary disposal units for each female units: clean, with a no touch lid, lined with removable polythene bag
- xxii. Rubbish bin: clean, with a “no touch” lid, lined with polythene for safe removal of garbage
- xxiii. Use of low cost energy/electric power fixes
- xxiv. Cubicle doors lockable from the inside

TABLE 3-2 PUBLIC TOILET URINAL RATIOS

No. of users	Urinal trough length	Urinal bowls
100	1.0 m	one single
200	1.9 m	two singles or equivalent
300	2.85 m	three singles or equivalent

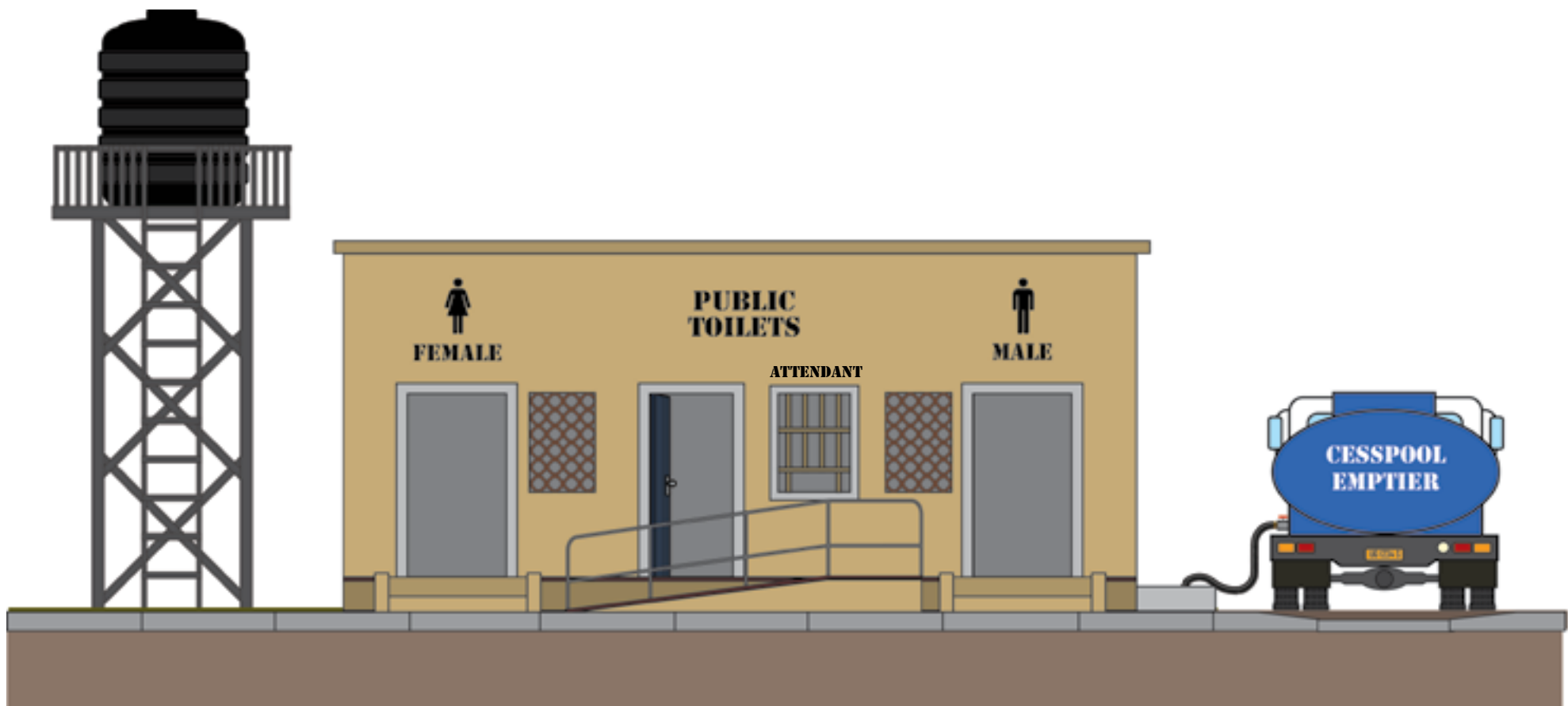


FIGURE 3-5 PUBLIC TOILETS

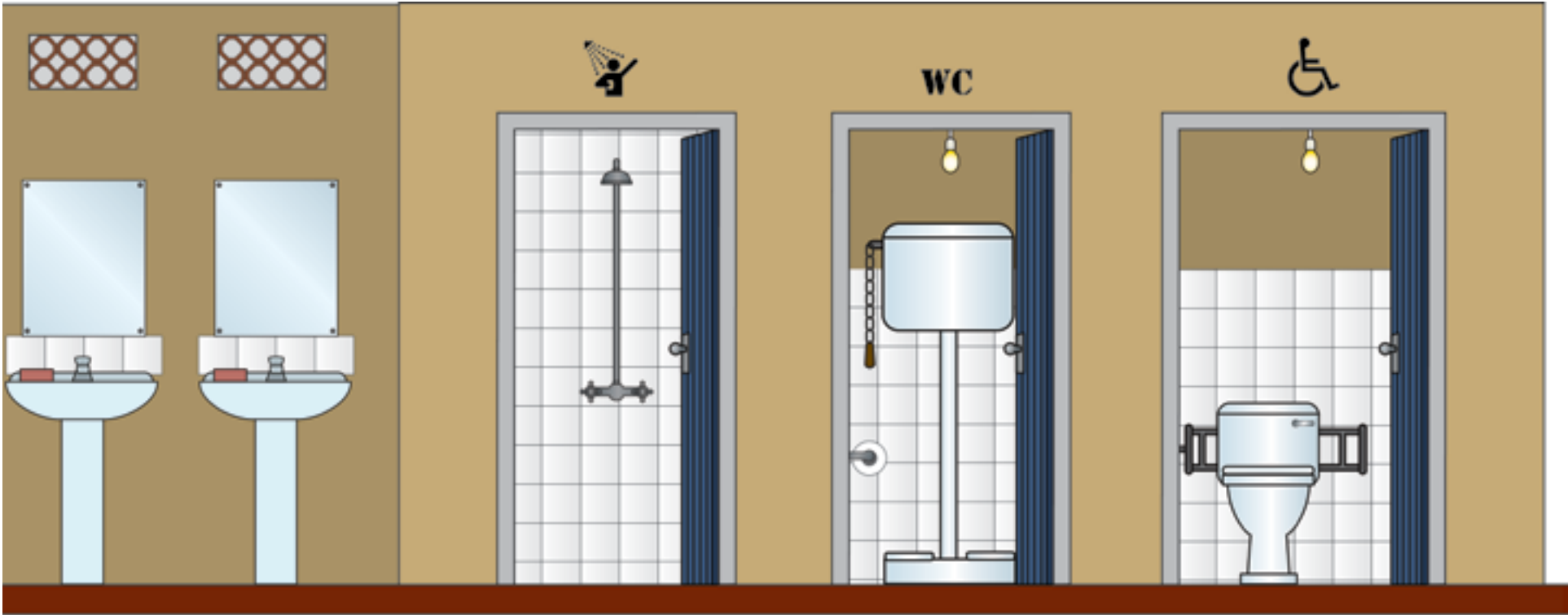


FIGURE 3-6 PUBLIC TOILET INTERIOR

Add-Ons and Key Toilet Accessories

INTRODUCTION

This section provides details and standards on (i) the septic tank, a key add-on to the water borne toilet options, (ii) hand washing facilities, (iii) the Urine Diversion Dry Toilet (UDDT), a household toilet option that applies to areas with high water tables and firm/rocky ground as well as where urban agriculture is favoured, and (iv) urinals.

4.1 Septic Tank

Septic tanks are watertight chambers sited below ground level for storage and treatment of excreta and grey water. They are made from reinforced concrete and brick work or plastic materials, this in prefabricated form or modular tank units. During operation of the septic tank, most of the solids settle in the first chamber, while oil and grease or scum float on top. A baffle prevents the scum from being carried over in the effluent which is then discharged to a soak pit. A soakaway is a porous-walled chamber or unlined chamber filled with gravel that allows the septic tank effluent to slowly soak into the ground and is covered with an impervious layer of polythene sheet or metallic sheet (Mara, 1996; Polprasert and Rajput, 1982; Tilley, 2014). Gravel packed soak pits are the common practice in Uganda.

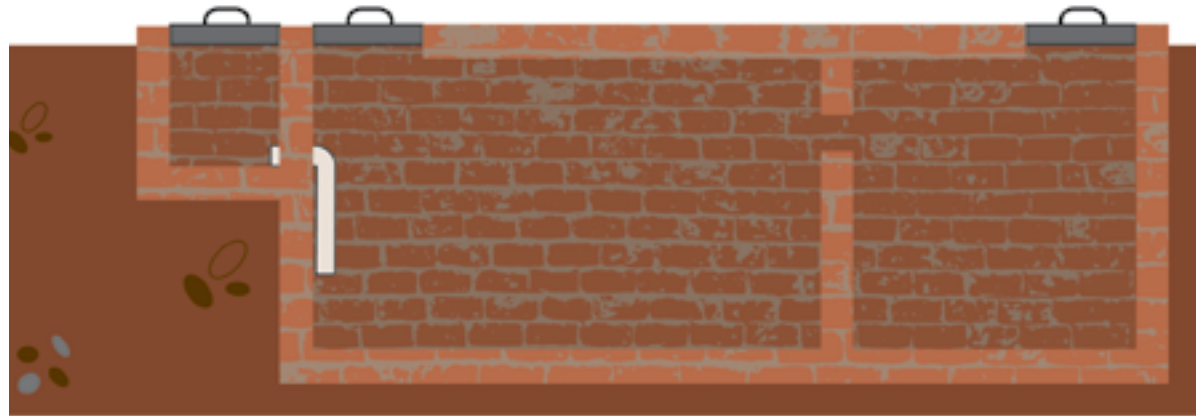
Key Minimum Standards – for the brick-based option

- i. Should comprise 2 underground water tight compartments/chambers
- ii. Should not be constructed under any buildings or nor within 3m of any building or plot boundary; nor within 30.5m of any ground water source
- iii. The base should be at least 15cm thick.
- iv. Ventilation pipe of at least 50mm diameter fitted with mesh/fly screen
- v. Each compartment of a septic tank shall have an access not less than 455mm x 610mm (rectangular) or opening 500mm diameter (circular).

No. of Users	Length (mm)	Width (mm)	Height (mm)	Capacity (l)
10	2300	750	900	1260
25	3300	750	900	1860
50	3600	900	1050	3280
100	5300	1100	1200	6560
200	6550	1400	1500	12080

TABLE 4-1 SEPTIC TANK SIZING TABLE

Brick option



Plastic options

Available plastic options are HDPE pre-fabricated units that come as a complete unit ready for installation. Modular tank units are also being piloted by the NGO Water for People. These options are also well suited for areas with a high water table



FIGURE 4-1 SEPTIC TANK OPTIONS

4.2 Hand Washing Facilities

Key Minimum Standards for Wash Basins

- i. Minimum size of 500mm in length and 400mm in width
- ii. Where there are 2 or more basins, one should be installed at child's height
- iii. Should be installed outside the toilets for common use by all users, especially for public toilets
- iv. 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

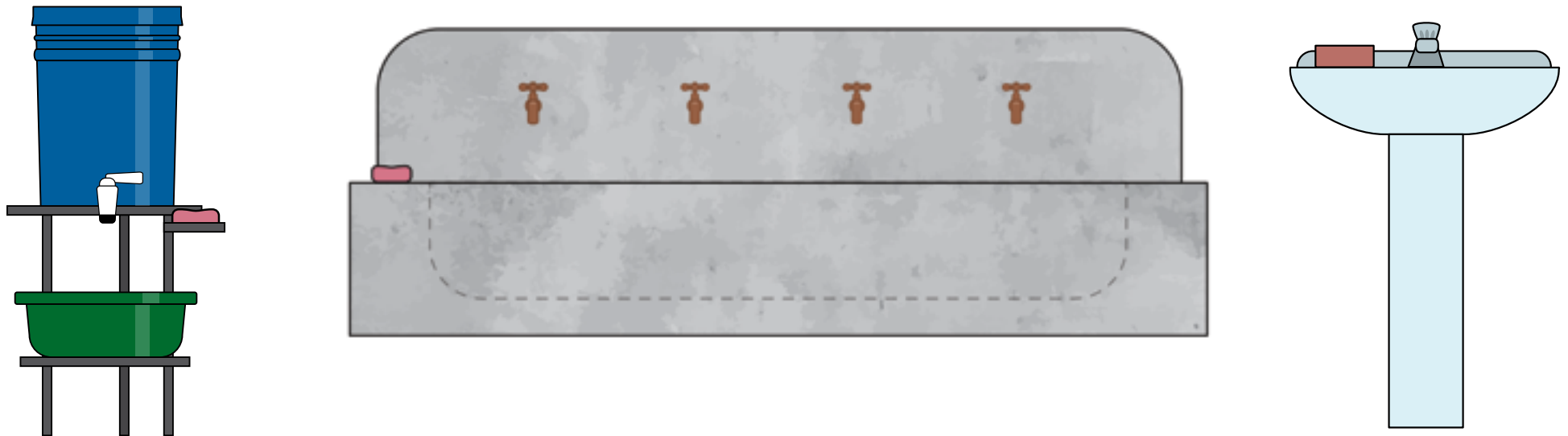
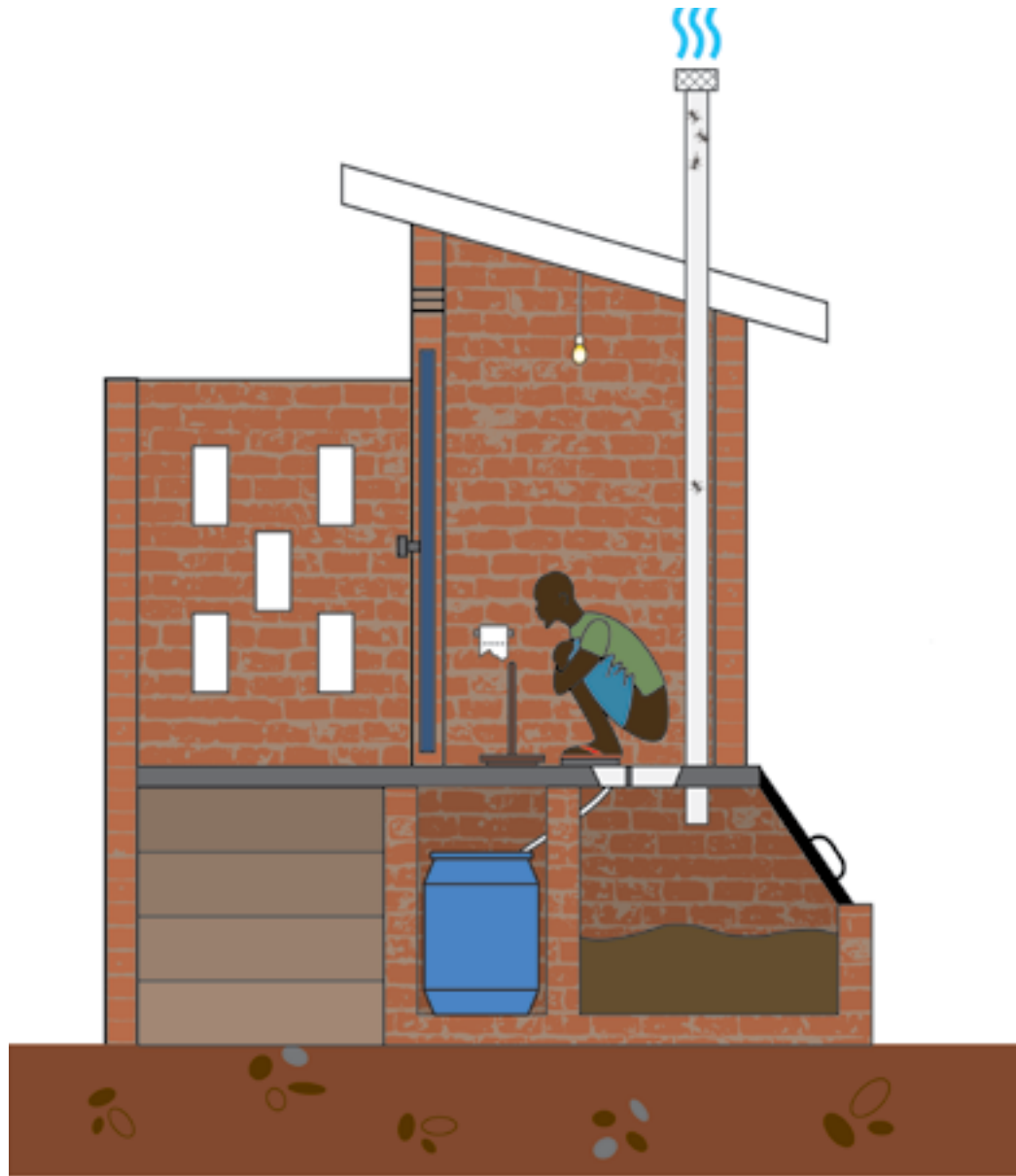


FIGURE 4-2 HAND-WASHING FACILITIES

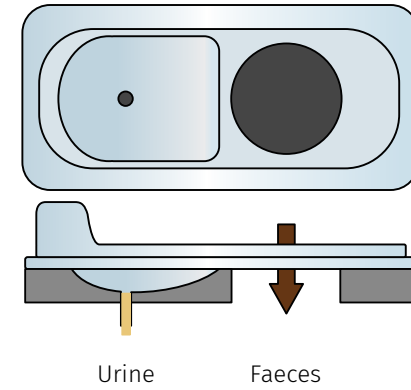
4.3 Urine Diversion Dry Toilet (UDDT)

Key Minimum Standards

- i. Superstructure/room:
 - Floor internal dimensions: 1.0m x 1.5m for a double vault with one door
 - Height: 2.15 m from the floor to underside of ceiling
 - Burnt brick walling: flush pointed internal and external finishes
- ii. Door raised (50mm) from the floor to allow in air
- iii. Include container for storing ash
- iv. Light for night use
- v. Holder or container for anal cleansing material
- vi. Slab: reinforced 50mm thick concrete
- vii. Piping to urine storage tanks should be:
 - Installed with at least a 1% slope for proper urine flow
 - Water tight to prevent wetting vault contents
 - Kept as short as possible and sharp angles (90°) avoided to limit scaling.
- viii. Wash the bowl with a mild acid and/or hot water to prevent build-up of deposits and scaling
- ix. Vent pipe: same standards as for VIP toilet
- x. Vaults/ chambers:
 - Two chambers facing direction of maximum sunshine
 - minimum floor dimensions of 750mm x 600mm
 - inclined (150) steel plate access door painted black for maximum heat retention
- xi. 6 months minimum sanitisation period for excreta before reuse
- xii. 1 month minimum sanitisation period for urine excreta before reuse.



Wiping stand



Washing stand

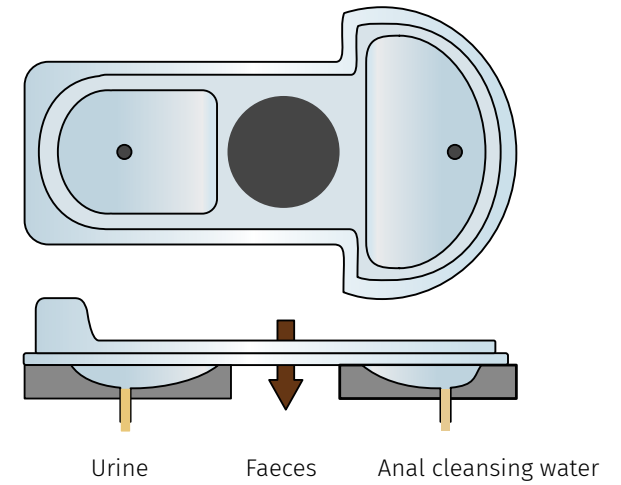


FIGURE 4-3 URINE DIVERSION DRY TOILET

4.4 Urinals

Key Minimum Standards

- i. May be individual wall-mounted units, more than 300mm wide, or as a trough properly graded towards the opposite wall
- ii. If more than one wall-mounted unit provided, one should be child friendly
- iii. Urinal troughs should be bordered by walls on the left and on the right side
- iv. Lip of the collection area should project from the wall by at least 250mm
- v. 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
- vi. Distance between urinals 750mm
- vii. Discharge pipes or urinal channels should be laid at a slope of not less than 1 in 40.

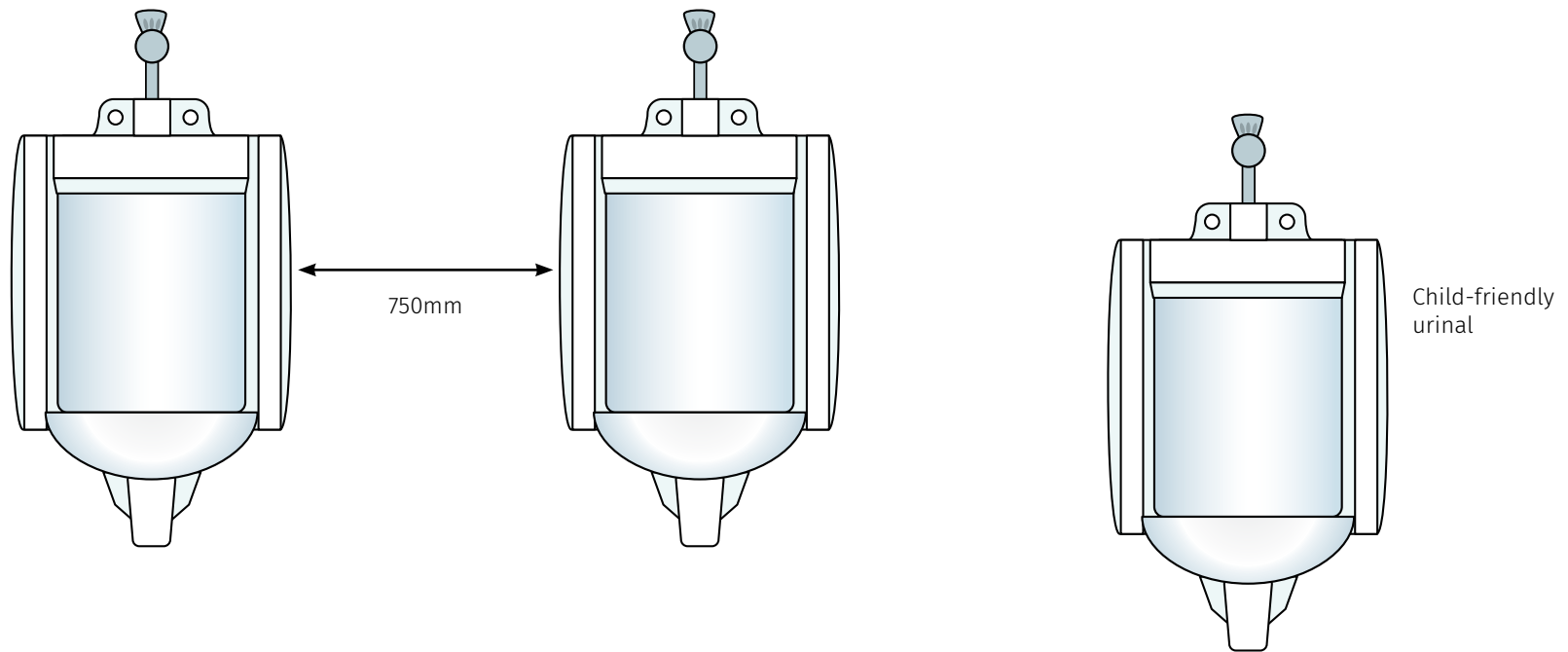


FIGURE 4-4 WALL MOUNTED URINALS

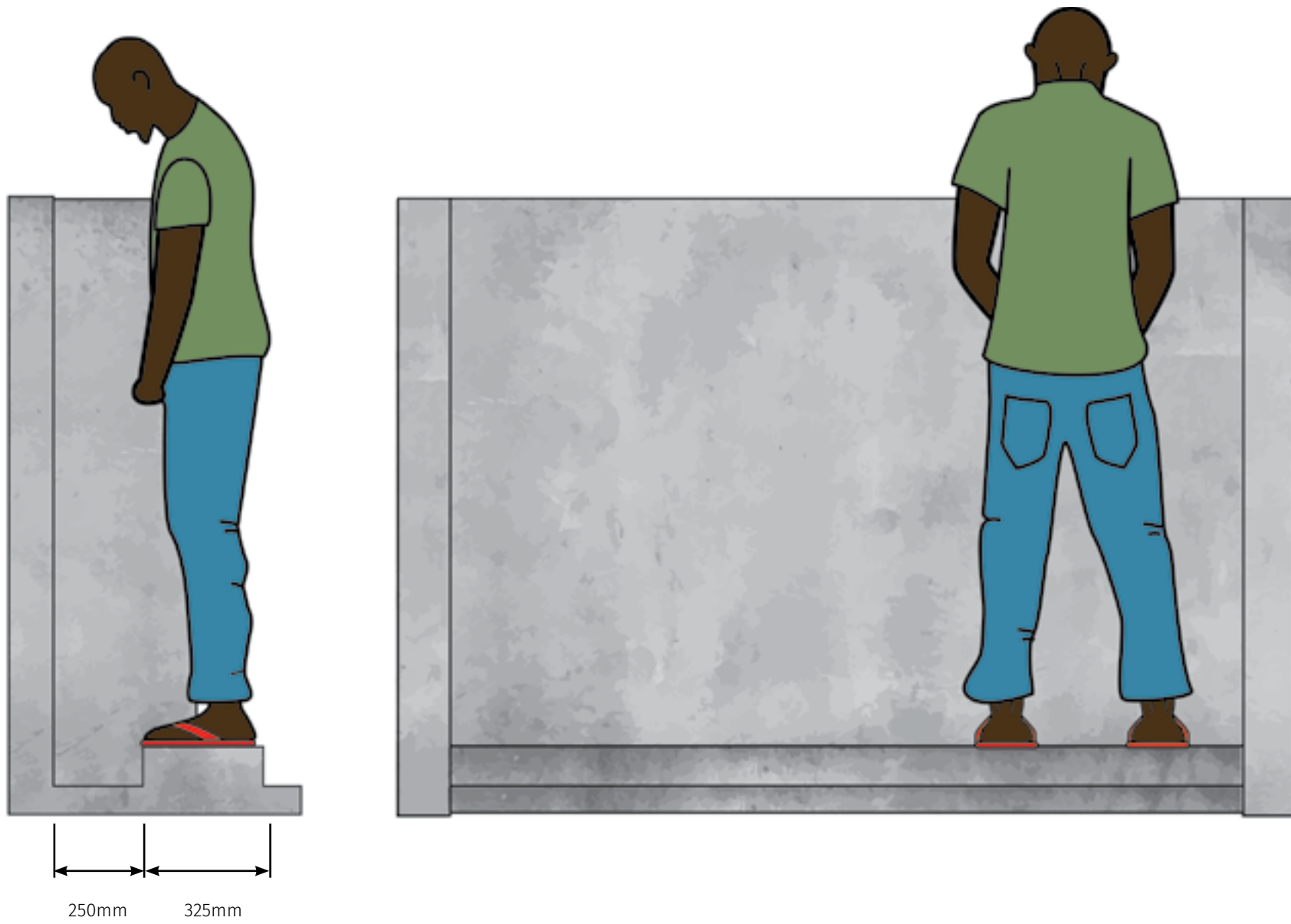


FIGURE 4-5 TROUGH URINAL

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Appendix

Detailed engineering design drawings with specifications
for sanitation technologies

KAMPALA CAPITAL CITY AUTHORITY
PUBLIC HEALTH AND ENVIRONMENT DIRECTORATE

**MINIMUM STANDARDS FOR ONSITE SANITATION
TECHNOLOGY OPTIONS IN KAMPALA**

First Edition

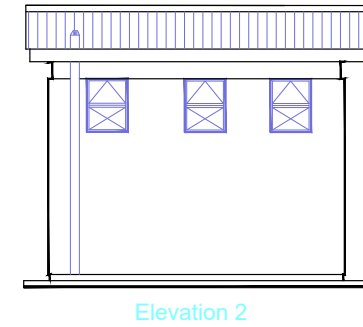
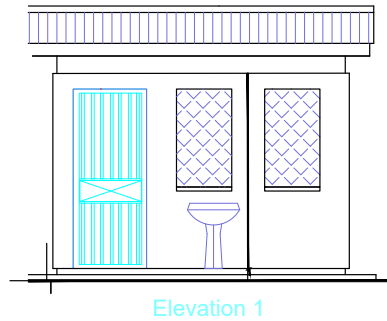
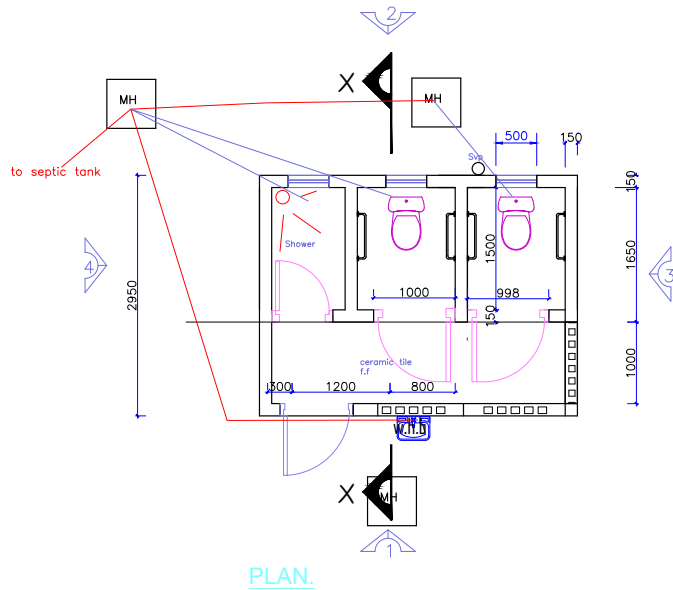
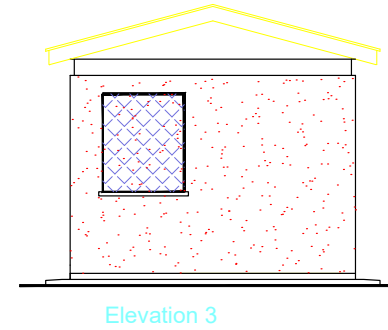
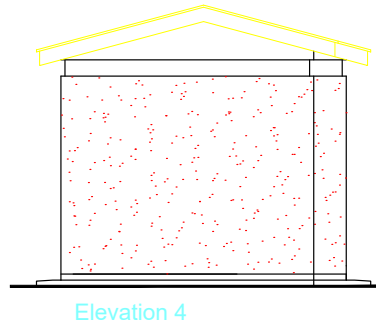
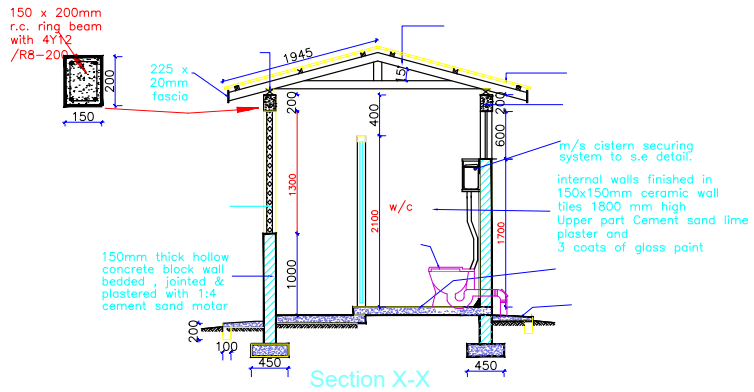
APPENDIX

Supported by:



HOUSEHOLD TOILETS

Cistern Flush Toilet
Pour Flush Toilet
Ventilated Improved Pit Latrine (VIP)
Urine Diversion Dry Toilet (UDDT)



NOTES

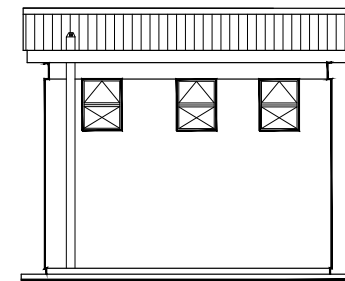
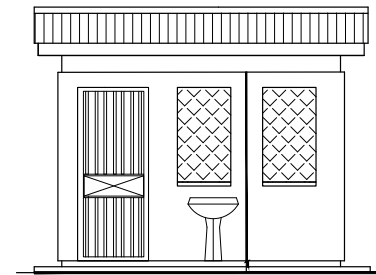
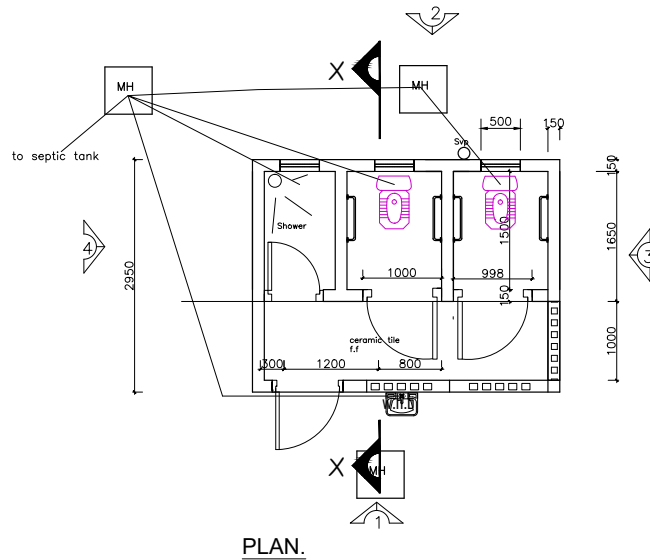
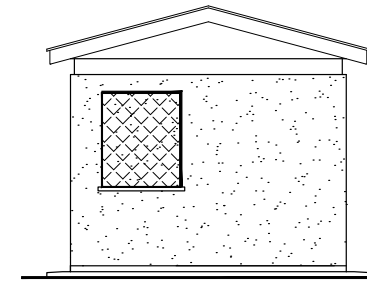
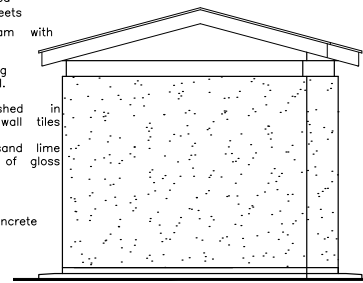
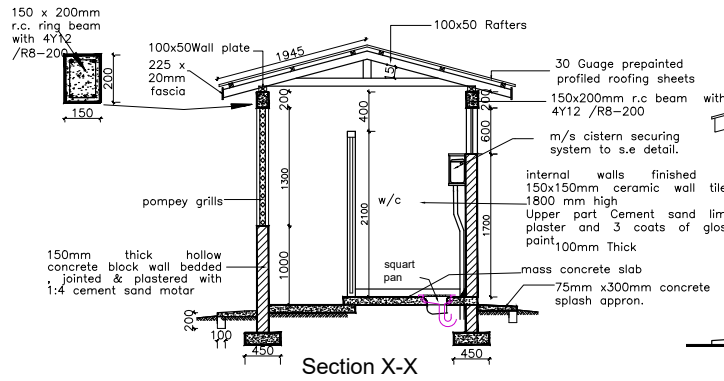


MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

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2 STANCE HOUSEHOLD SITTING FLUSH TOILET

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DESIGNED:	
DRAWN:	MLB
CHECKED:	
APPROVED:	

DATE:	APRIL 2016
DRG. No.:	SD/HH/FT-ST/01



NOTES

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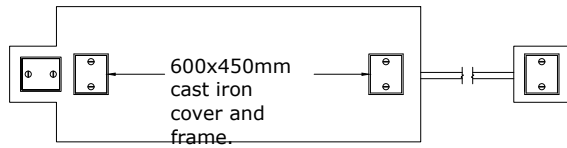
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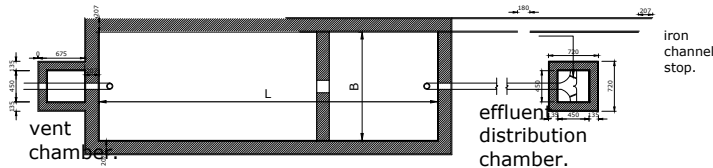
2 STANCE HOUSEHOLD SQUATTING FLUSH TOILET

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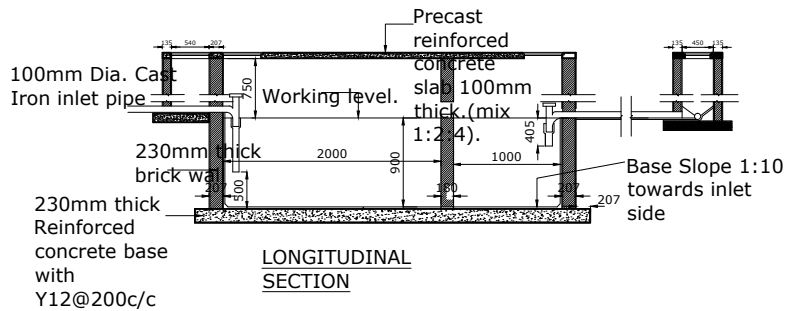
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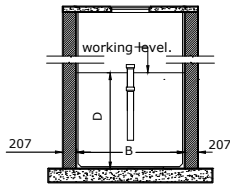
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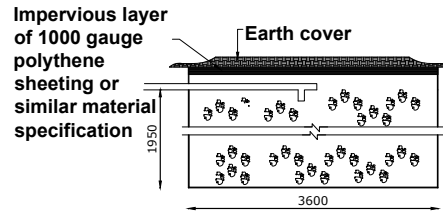
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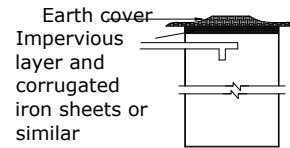
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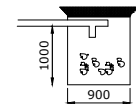
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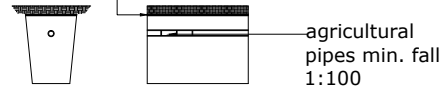
SOAKPIT TYPE 2.



SOAKPIT TYPE 2



SECTIONS SOAKPIT TYPE 1.



PERCOLATION TRENCH SECTIONS SOAKPIT TYPE 1.

NOTES AND REVISIONS.
PERCOLATION TRENCHES.
1- At least one foot of percolation trench should be provided for every eight litres of effluent to be disposed at 24 hours.

2-When sediment is seen in effluent the tank should be desludged without delay.

3-One trench should be at rest whilst the other is in use no trench should be used continuously for more than a month.

4-For deep tanks the cover slab should be 375mm above working level and manholes only carried up to ground level walls of manhole to be carried on 230x230mm concrete beams with 68mm diameter rods.

SIZES OF INSPECTION CHAMBERS

DEPTH TO INVERT	INTERNAL DIMENSIONS	WALL THICKNESS	FOUNDATION THICKNESS
up to 450mm	450 x 450mm	115mm	125mm
475 x 900mm	450 x 600mm	115mm	125mm
925 x 1500mm	600 x 1050mm	225mm	125mm
over 1500mm	750 x 1050mm	225mm	240mm

NOTES

1. Brickwork to be built in 1:6 cement mortar and rendered internally in 1:3 cement paste
2. 12mm thick foundation to be 1:3:6 cement concrete.



MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

DRAWING TITLE

STANDARD SEPTIC TANK

SCALE: On A3 Sheet

SHEET No.

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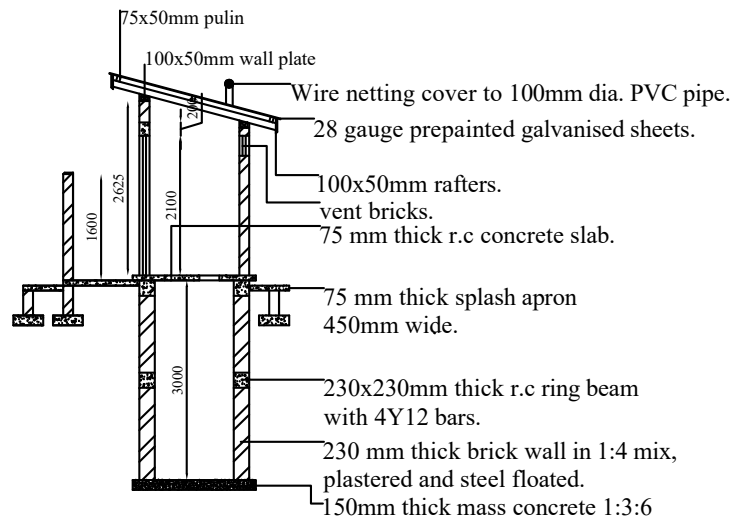
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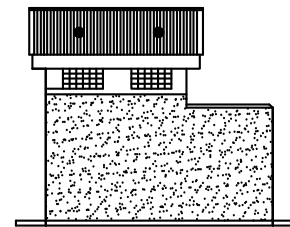
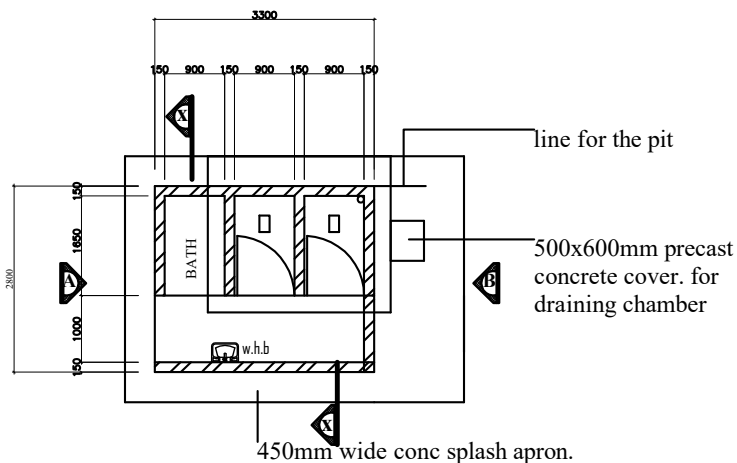
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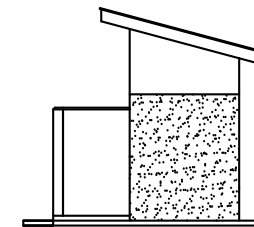
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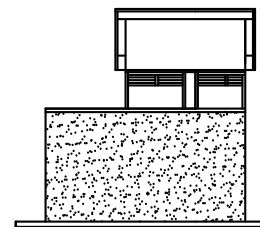
SECTION X-X



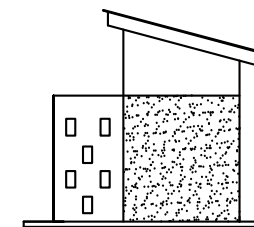
BACK ELEVATION



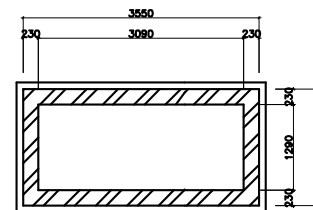
SIDE ELEVATION A



FRONT ELEVATION



SIDE ELEVATION B



PLAN FOR THE PIT

NOTES

1. All dimensions are in millimeters and written dimensions take preference to scaled dimensions.
2. All walls be reinforced with hoop iron at every three alternate courses.
3. All reinforced concrete be to details provided by the Engineer as per the specifications.
4. All doors be 900mmx 2100mm high steel casement solid doors with permanent louvers above except the disabled unit.
5. All excavations be made free of water and loose material and sides protected from collapse before proceeding with any other works.

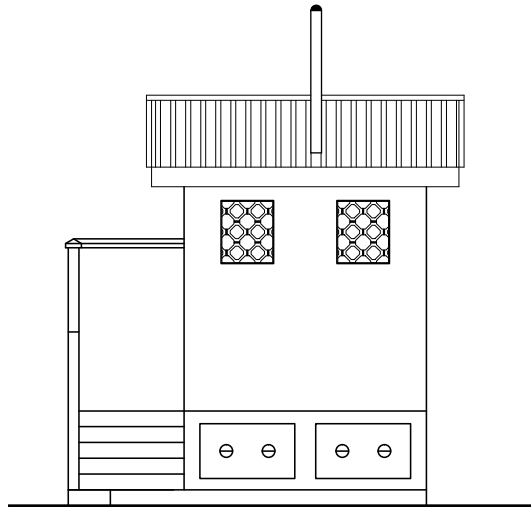


MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

2 STANCE PIT LINED VIP LATRINE WITH BATHROOM PLAN AND SECTIONS

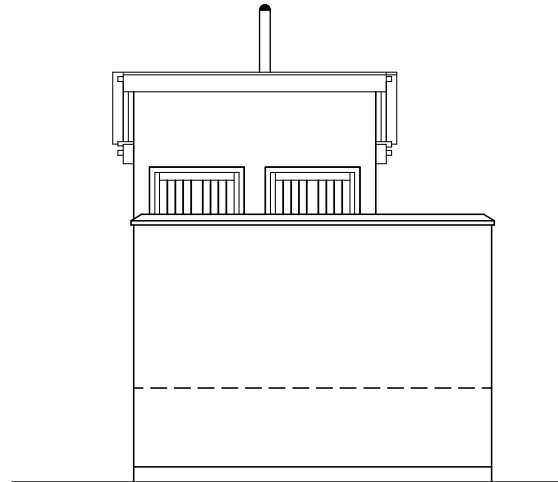
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DRAWN:	MBL
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DATE:	APRIL 2016
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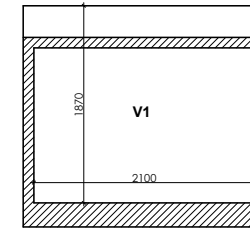
REAR VIEW

Scale: 1:75



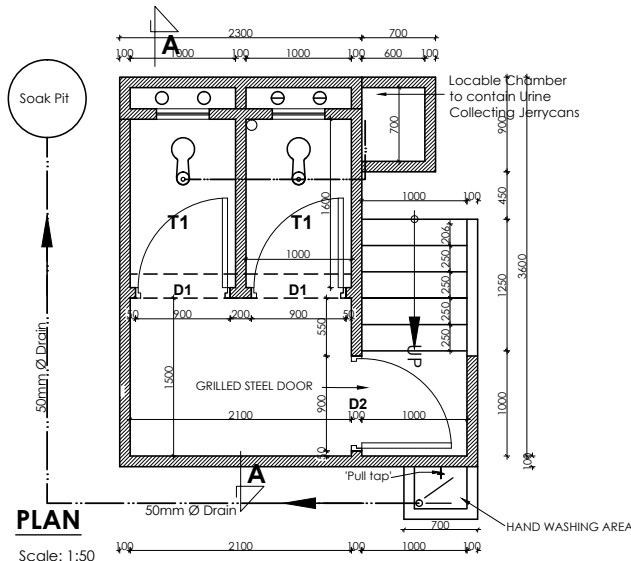
FRONT VIEW

Scale: 1:75



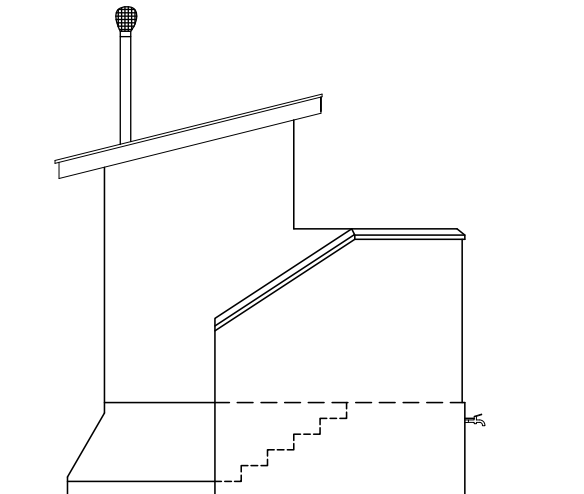
VAULT SECTION

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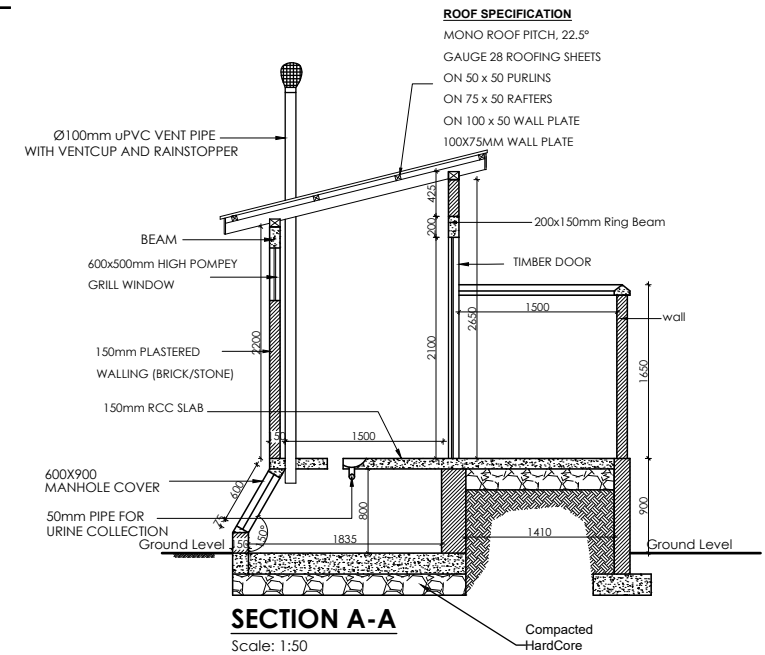
PLAN

Scale: 1:50



TYPICAL SIDE VIEW

Scale: 1:75



SECTION A-A

Scale: 1:50

ROOF SPECIFICATION

- MONO ROOF PITCH, 22.5°
- GAUGE 28 ROOFING SHEETS
- ON 50 x 50 PURLINS
- ON 75 x 50 RAFTERS
- ON 100 x 50 WALL PLATE
- 100x75MM WALL PLATE

1. All dimensions are in mm unless stated otherwise.
2. All levels are in metres above sea level.
3. For Site location see Dwg. WSDf-N/LOT2/PAC/2.0.0
4. Structural details are not included.
5. All structural concrete is Class 25/10.
6. All mass concrete is Class 15/10.

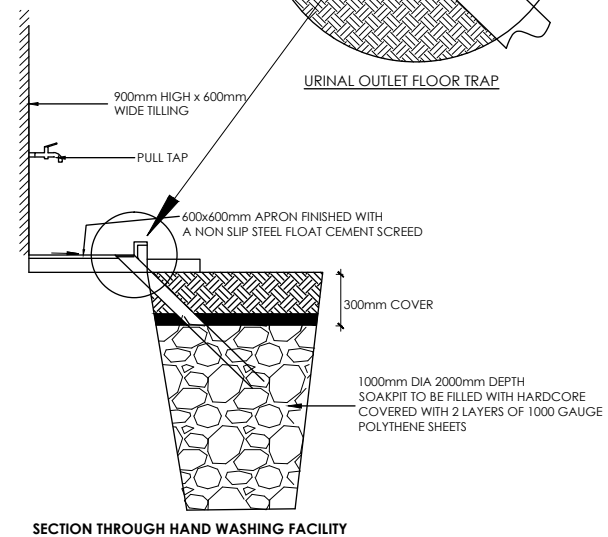
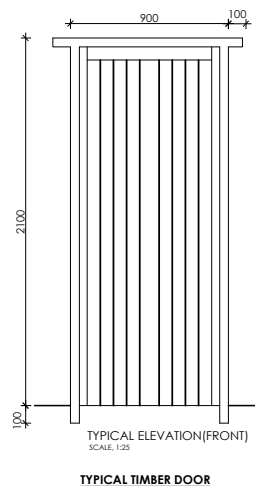
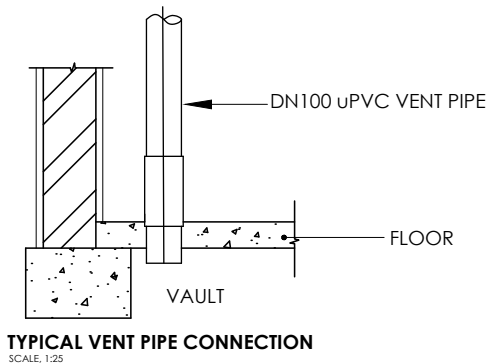
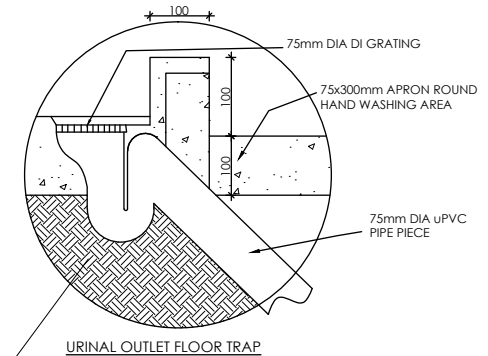
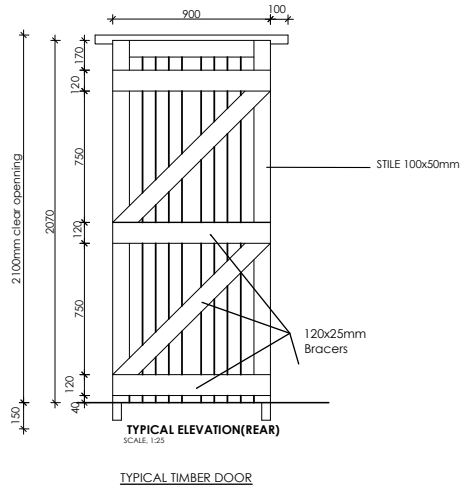
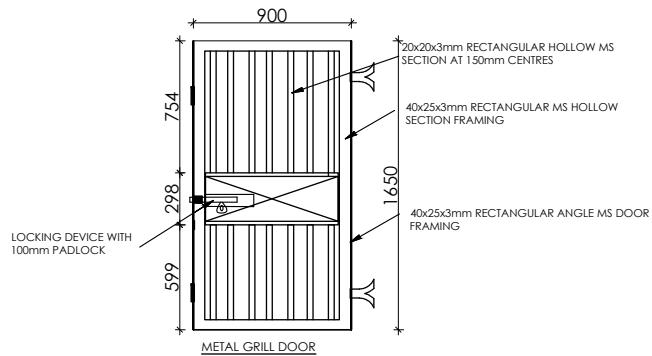


PROJECT
**MINIMUM STANDARDS FOR SANITATION
TECHNOLOGIES IN KAMPALA, UGANDA.**

DRAWING TITLE
**2 STANCE ECO-SAN TOILET
PLAN, SECTIONS AND ELEVATIONS**

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SURVEYED:	
DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

DATE:	APRIL 2016
DRG. No.:	SD/HH/ECO/01



NOTES

1. All dimensions are in mm unless stated otherwise.
2. All levels are in metres above sea level.
3. For Site location see Dwg. WSDf-N/LOT2/PAC/2.0.0
4. Structural details are not included.
5. All structural concrete is Class 25/10.
6. All mass concrete is Class 15/10.



MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

DRAWING TITLE

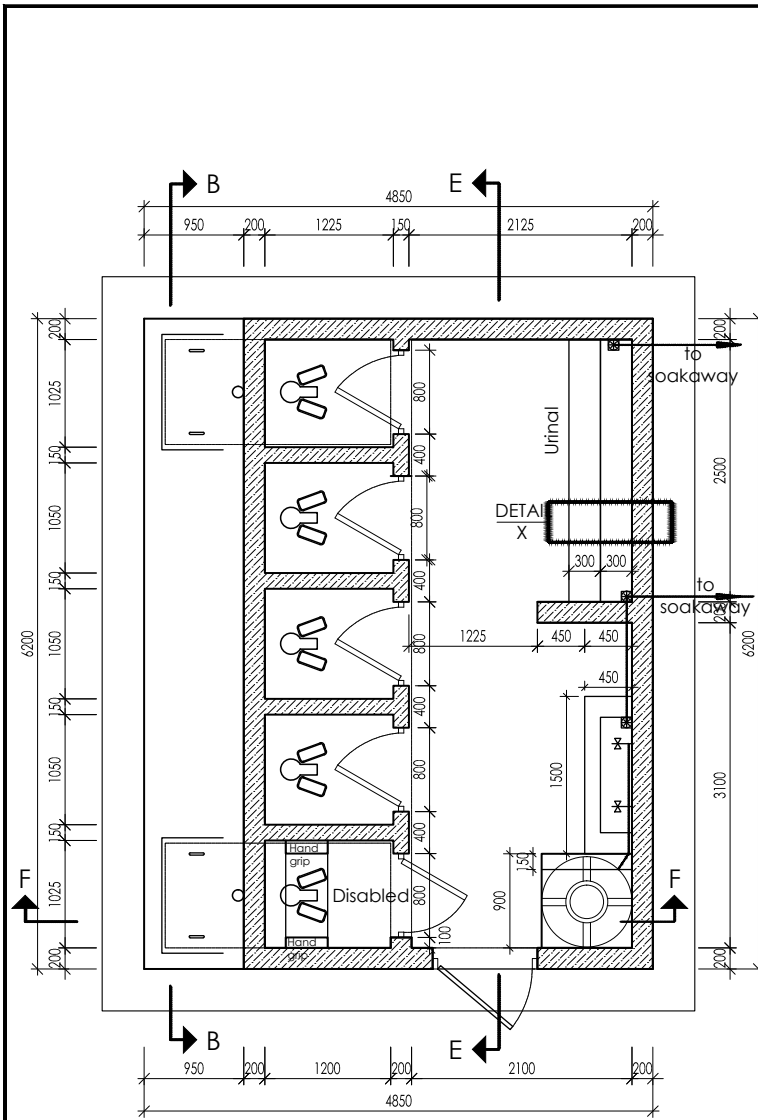
2 STANCE ECO-SAN TOILET CONSTRUCTION DETAILS

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DRAWN:	LM
CHECKED:	AK
APPROVED:	

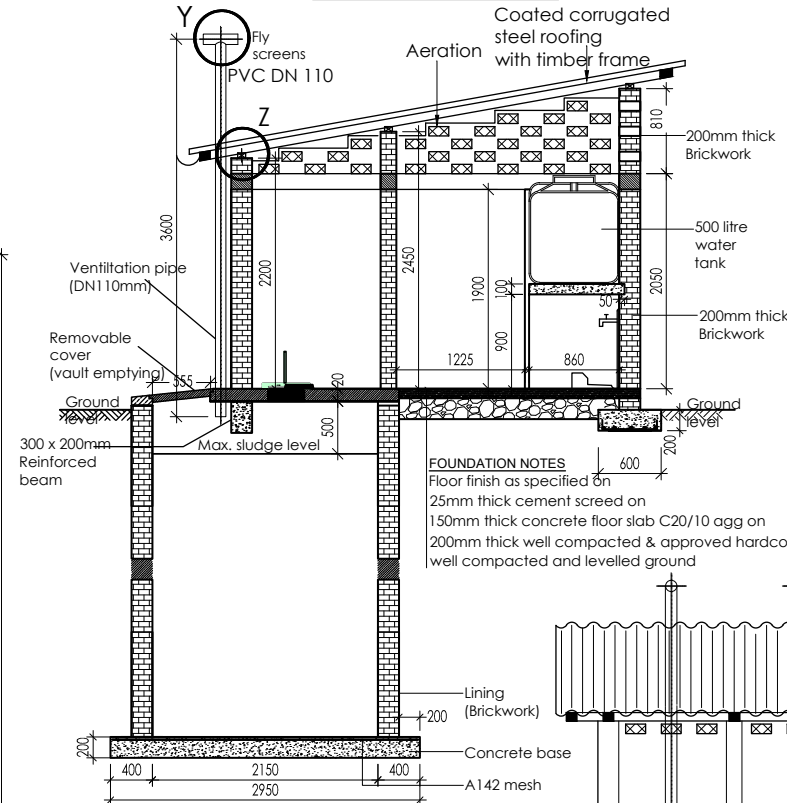
DATE:	APRIL 2016
DRG. No.:	SD/HH/ECO/02

SCHOOL TOILETS

Ventilated Improved Pit Latrine (VIP)
Water Closets
Bio-Toilet

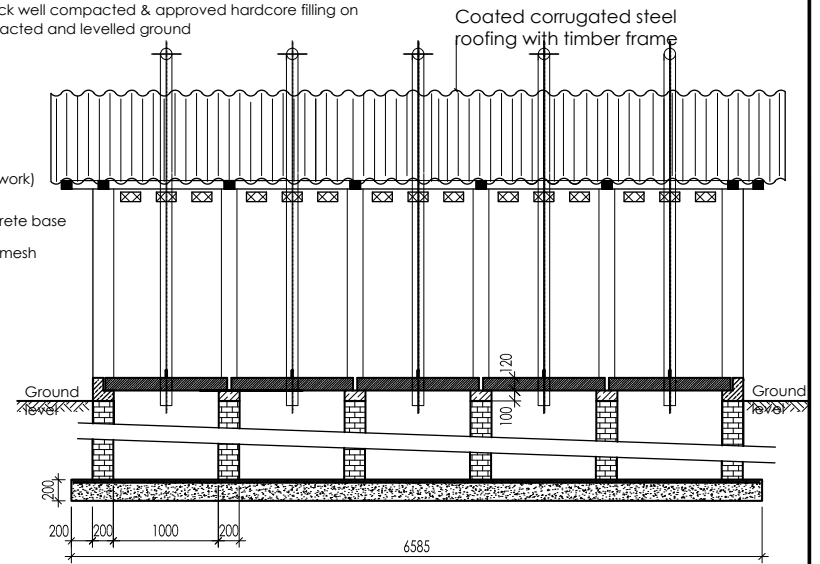


**SECTION F-F
Single Vault VIP (Scale 1:50)**



FOUNDATION NOTES
 Floor finish as specified on
 25mm thick cement screed on
 150mm thick concrete floor slab C20/10 agg on
 200mm thick well compacted & approved hardcore filling on
 well compacted and levelled ground

Single Vault VIP (Scale 1:50)



- NOTES**
1. All dimensions are in mm unless stated otherwise.
 2. All levels are in metres above sea level.
 3. For Site location see project manager
 4. Structural details are not included.
 5. All structural concrete is Class 25/10.
 6. All mass concrete is Class 15/10.



PROJECT
**MINIMUM STANDARDS FOR SANITATION
 TECHNOLOGIES IN KAMPALA, UGANDA.**

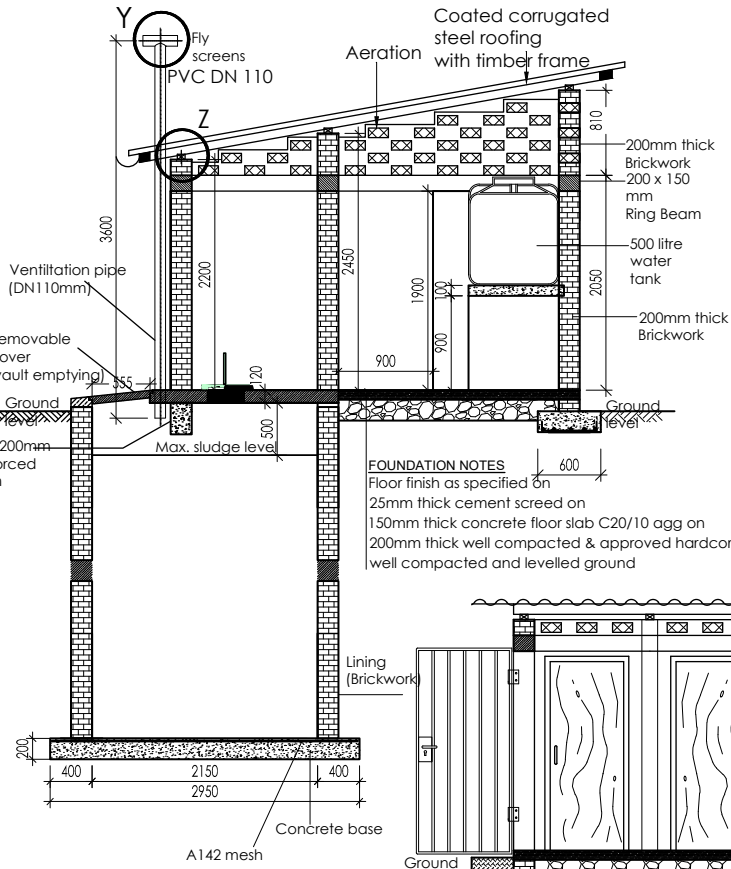
DRAWING TITLE
**6 STANCE - SINGLE VAULT VIP-BOYS
 FLOOR PLAN ,SECTION B-B & F-F,DETAIL X,Y & Z**

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DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

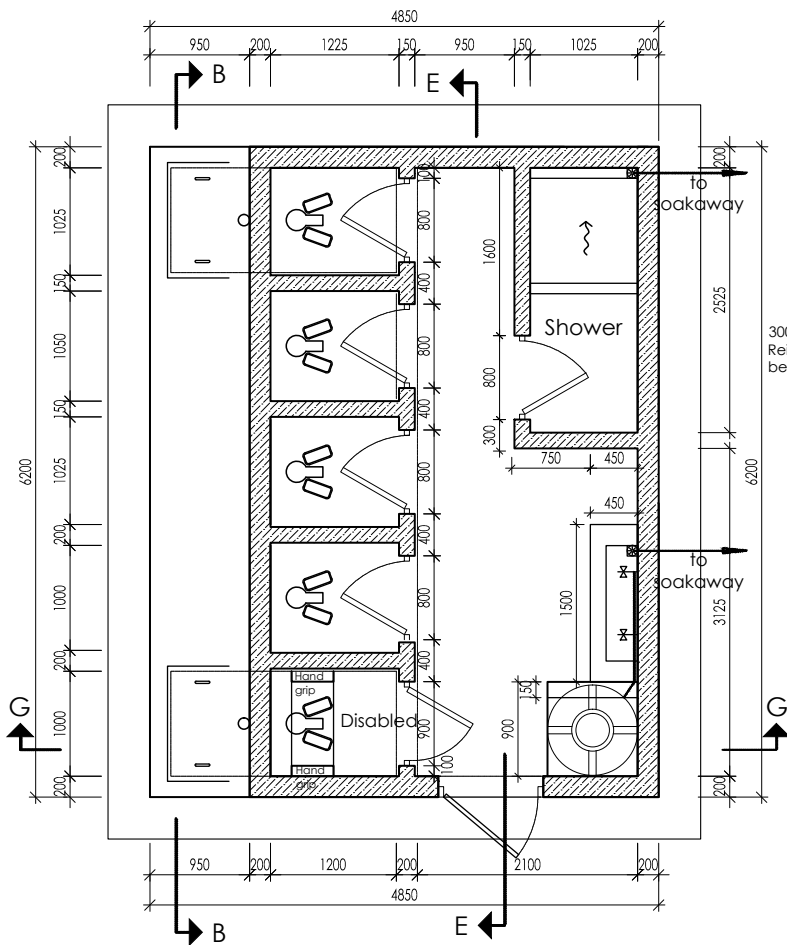
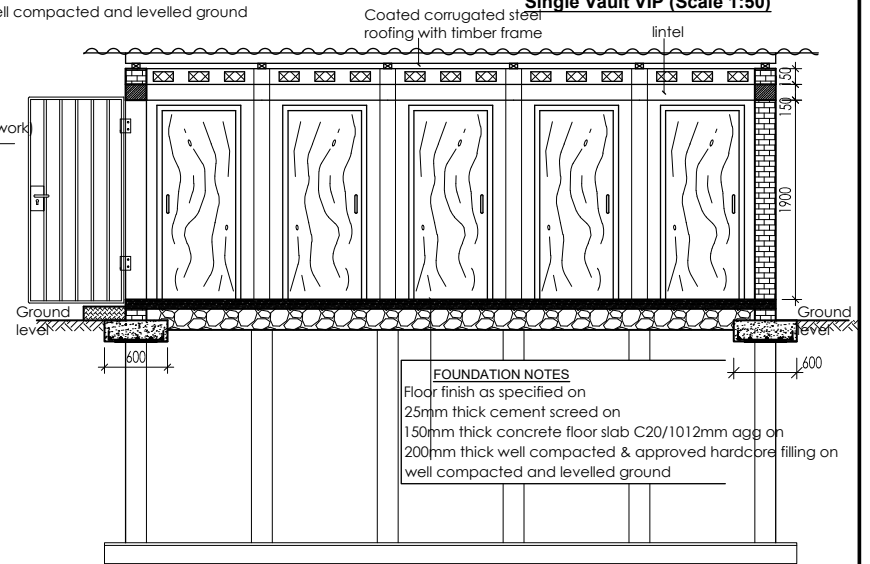
DATE: **APRIL 2016**

DRG. No.: **SD/INST/VIP/01**

**SECTION G-G
Single Vault VIP (Scale 1:50)**



**SECTION E-E
Single Vault VIP (Scale 1:50)**



- NOTES**
1. All dimensions are in mm unless stated otherwise.
 2. All levels are in metres above sea level.
 3. For Site location see Project Manager
 4. Structural details are not included.
 5. All structural concrete is Class 25/10.
 6. All mass concrete is Class 15/10.

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a Better City

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

PROJECT
MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

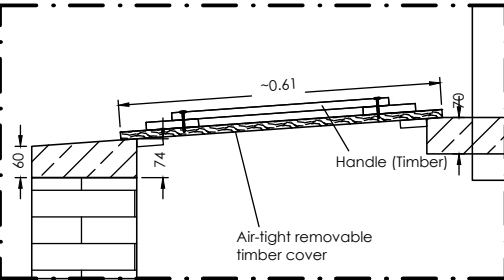
DRAWING TITLE
6 STANCE - SINGLE VAULT VIP-GIRLS FLOOR PLAN ,SECTION B-B & F-F,DETAIL X,Y & Z

SCALE:	As Shown
SURVEYED:	
DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

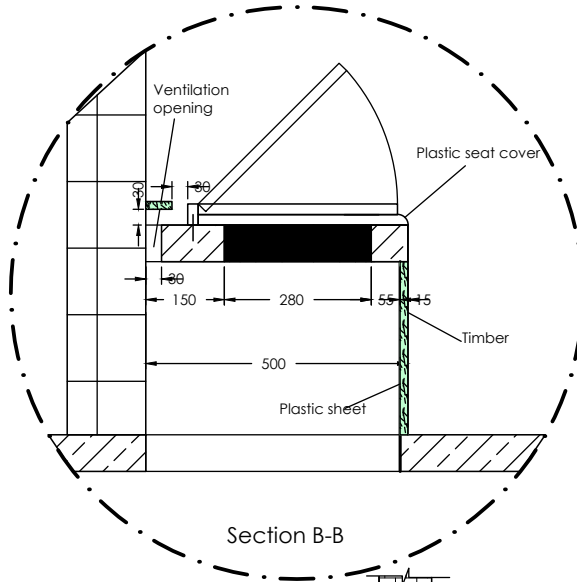
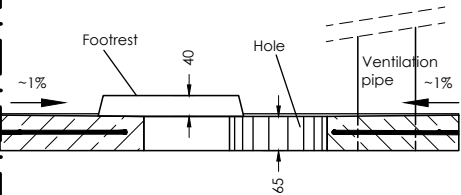
DATE: APRIL 2016

DRG. No.: SD/INST/VIP/02

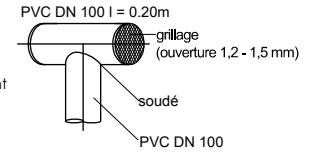
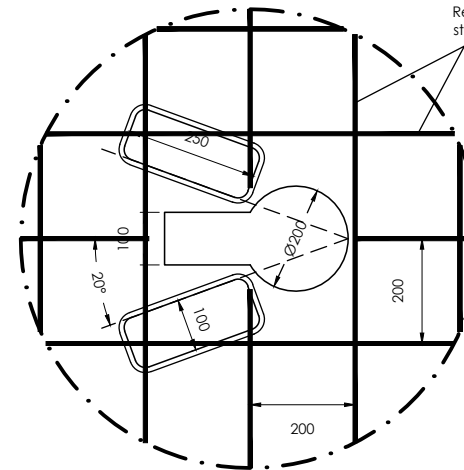
Detail
Removable vault cover



Defecating hole (squat)

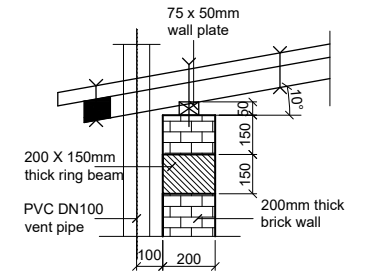


Defecating hole (squat)

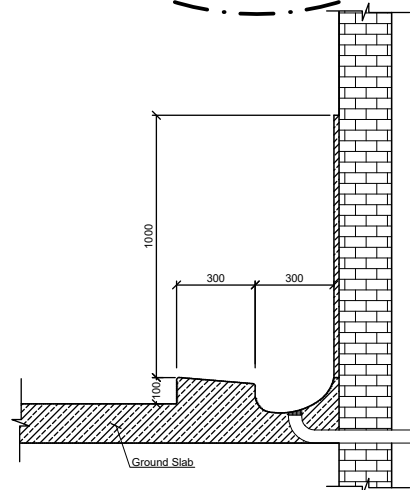
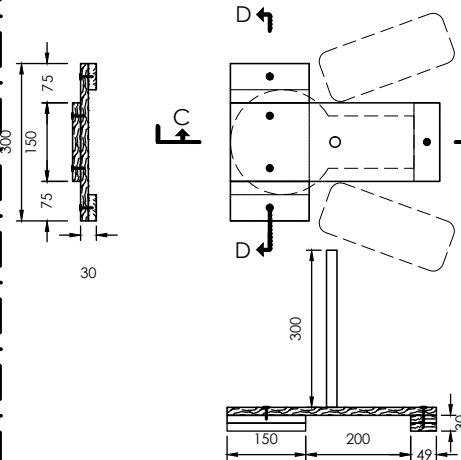


Detail Y, Scale 1:15

Detail Z, Scale 1:20

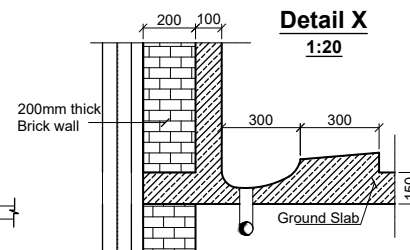


Detail
Removable lid cover (squat)

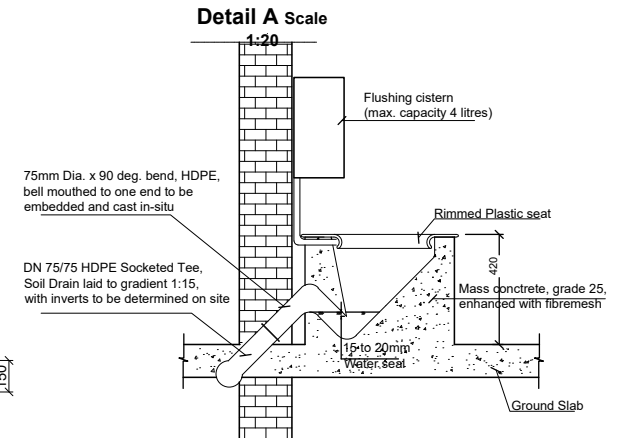


URINAL OUTLET FLOOR TRAP
Scale 1:20

Detail X
1:20



Detail A Scale
1:20



- NOTES
1. All dimensions are in mm unless stated otherwise.
 2. All levels are in metres above sea level.
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 4. Structural details are not included.
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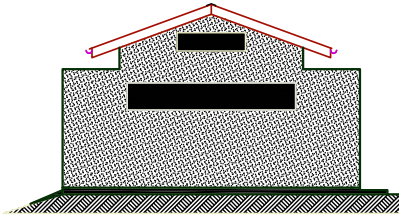
PROJECT
MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

DRAWING TITLE
**6 STANCE - SINGLE VAULT VIP
DETAILS X, Y & Z**

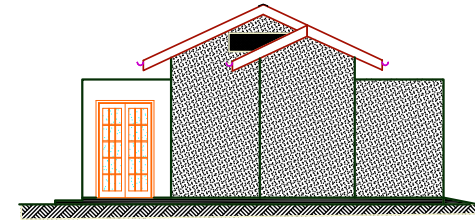
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SURVEYED:	
DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

DATE:	APRIL 2016
DRG. No.:	SD/INST/VIP/03

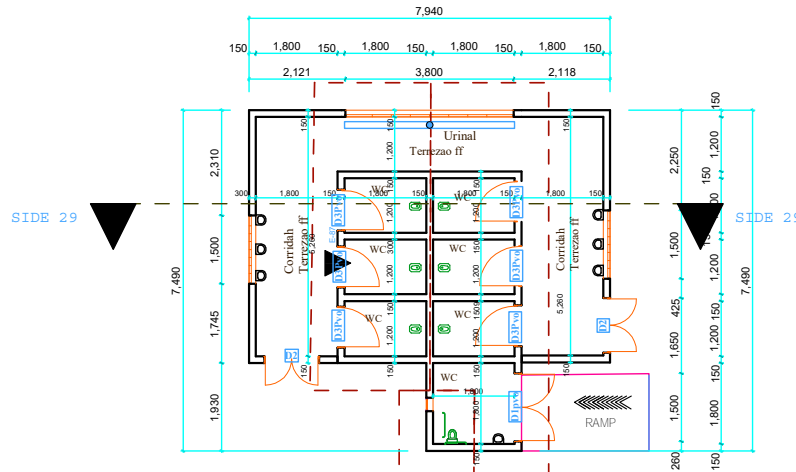
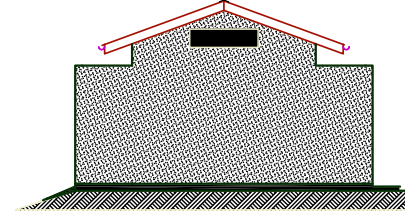
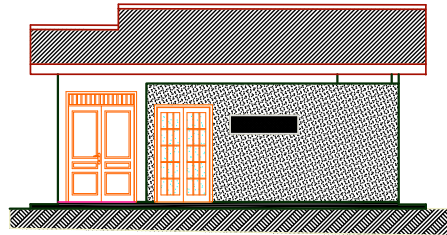
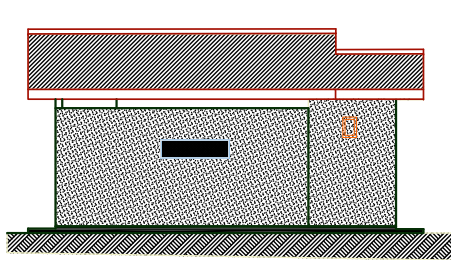
DOORS SCHEDULE		
D3Pvo No-14 Solid Steel door with Permanent vent above	D4 No-01 Metalling Grill Door	D1Pvo No-2 Solid Steel Metalling door with permanent vent over



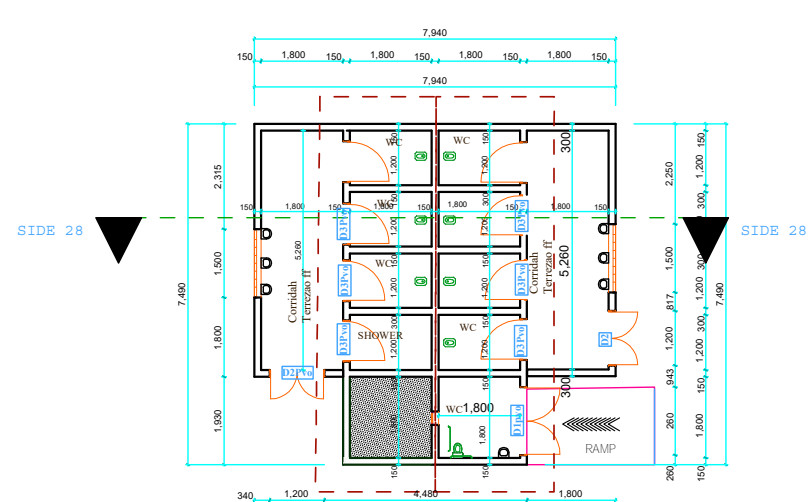
URINAL SIDE ELEVATION
Scale 1:100



ELEVATION 02
Scale 1:50



**GROUND FLOOR PLAN
FOR BOYS' WING**
Scale 1:50



**GROUND FLOOR PLAN
FOR GIRLS' WING**
Scale 1:50

NOTES

1. Reinforce all walls <200mm with hoop iron
2. P.V. indicates Permanent ventilations
3. Drainage to be PVC pipe encased in concrete
4. Heavy duty covers for all inspection chambers
5. 500g polythene and anti-termite treatment
6. ff Non slip cer tiles for WC and shower

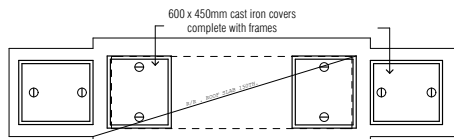


**MINIMUM STANDARDS FOR SANITATION
TECHNOLOGIES IN KAMPALA, UGANDA.**

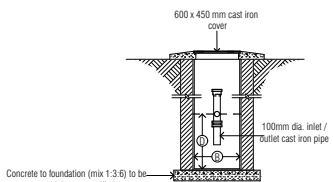
DRAWING TITLE
SCHOOL WATER BORNE TOILETS

SCALE:	As Shown
SURVEYED:	
DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

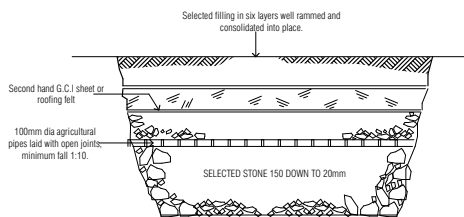
DATE:	APRIL 2016
DRG. No.:	SD/INST/WC/01



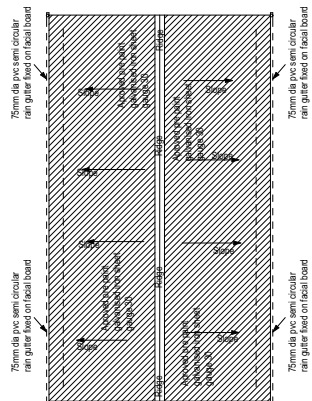
PLAN AT TOP (Scale 1:50)



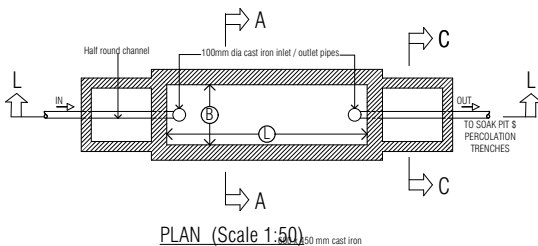
SECTION A - A (Scale 1:50)



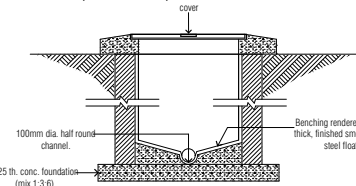
LONGITUDINAL SECTION THRU PERCOLATION TRENCH



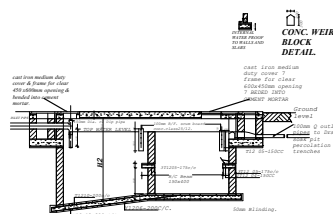
ROOF PLAN (SCALE 1:50)



PLAN (Scale 1:50)



SECTION C - C (Scale 1:25)



SEPTIC TANK DETAILS

ROOF DETAILS

- Roof pitch at 25deg.
- Approved roofing galvanised pre painted iron sheet gauge 30 on,
- 100x50mm main rafters 1800mm c/c with,
- 150x50mm timber struts & ties on,
- 150x50mm tie beam on,
- 100x75mm wall plate and,
- 200x25mm fascia, boards.

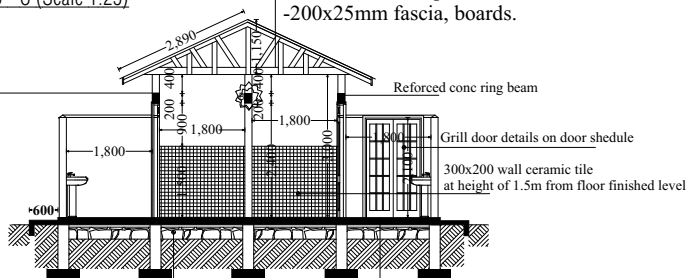
- WALLS**
- EXTERNAL WALLS**
 -200mm thick blocks, wall damp proof course (50 gauge polythene, 150mm laps on bunten hezzame base)
- INTERNAL WALLS**
 -200mm thick blocks,
 -Apply 9mm first coat of cement & sand (1:6),
 -3mm second coat of cement and lime putty (1:10) finished with steel trowel,
 -1 coat universal under coat,
 -2 coats of silk vinyl emulsion paint (white)

FOUNDATION NOTICE

- 300*300*10mm approved non-slip ceramic tiles jointing in cement mortar, grouting joints with white cement.
- 200mm thick conc floor slab, mix 1:3:6/1inch agg. on,
- Dpm layer 1000 gauge polythene sheet on,
- 50mm sand blinding on,
- 250mm well compacted hard core on
- A well compacted marrum

SKIRTING

- 300*150*10mm ceramic tiles jointing in cement mortar (1:4), grouting joints with white cement



TYPICAL SECTION X-X (SCALE 1:50)

- 25mm thick terrezao on.
- 25mm thick cement sand screed on
- 200mm thick conc floor slab, mix 1:3:6/1inch agg. on,
- Dpm layer 1000 gauge polythene sheet on,
- 50mm sand blinding on,
- 250mm well compacted hard core on
- A well compacted marrum

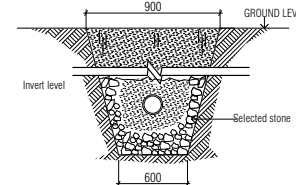
SKIRTING

- 150*20mm thick terrezao

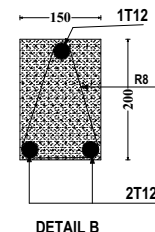
DIMENSION OF SEPTIC TANK					
INTERNAL DIMENSIONS					
NO OF CHAMBERS	LENGTH [A]	WIDTH [B]	DEEP [D]	CAPACITY IN LITRES	NO
6	1800	750	900	1000	8
10	2300	750	900	1200	12
15	2500	750	900	1320	18
20	2900	750	900	1600	24
25	3300	750	900	1860	30
30	2400	900	1050	2100	36
35	2600	900	1050	2220	42
40	3000	900	1050	2620	48
45	3300	900	1050	2880	54
50	3600	900	1050	3280	60
60	3800	1100	1200	3920	66
70	4000	1100	1200	4680	72
80	4300	1100	1200	5240	78
90	4700	1100	1200	5800	84
100	5100	1100	1200	6360	90
125	5800	1400	1500	7960	96
150	6000	1400	1500	9280	102
175	5800	1400	1500	9280	108
200	6300	1400	1500	12080	114
225	6800	1400	1500	13980	120
250	7100	1400	1500	15520	126
275	7300	1400	1500	15600	132
300	7600	1400	1800	16840	138

SIZES OF INSPECTION CHAMBERS			
DEPTH TO INVERT	INTERNAL DIMENSIONS	WALL THICKNESS	FOUNDATION THICKNESS
up to 450mm	450 x 450mm	115mm	125mm
475 to 900mm	450 x 600mm	115mm	125mm
925 to 1500mm	600 x 1050mm	225mm	125mm
over 1500mm	750x 1050mm	255mm	240mm

brick work to be built [1:3] cement mortar and rendered internally in [1:3] plaster 12mm thick foundation to be [1:2.4] cement concrete.



CROSS SECTION THRU DRAIN PIPE TRENCH



DETAIL B

NOTES:

- All dimensions to be checked on site, written dimension to be followed in preference to scaled dimensions.
- All walls to be reinforced with hoop iron at intervals of 3 courses.
- All Reinforced concrete work is to be in accordance with structural Engineers Details.
- All sanitary work to be in accordance with Local Authorities regulations and rules.
- All waste pipes and soil are to be in duct and the bends to have all cleaning eyes accessible from outside.
- Structural Drawings also to be read in conjunction with all contract drawings .
- [b]. Concrete is grade 20 [ie 1:2.4 nominal mix], aggregate size 20mm.

[a]. Cover to outermost Reinforcement

[a]. Column 20mm. [b] Staircase 25mm.

PROJECT:

CLIENTS:

BUILDING CONSULTANTS:

ARCHITECT:

Others:

ARCHITECT:

Engineer

SHEET TITLE:

CLIENTS NUMBER: DRAWING NO:

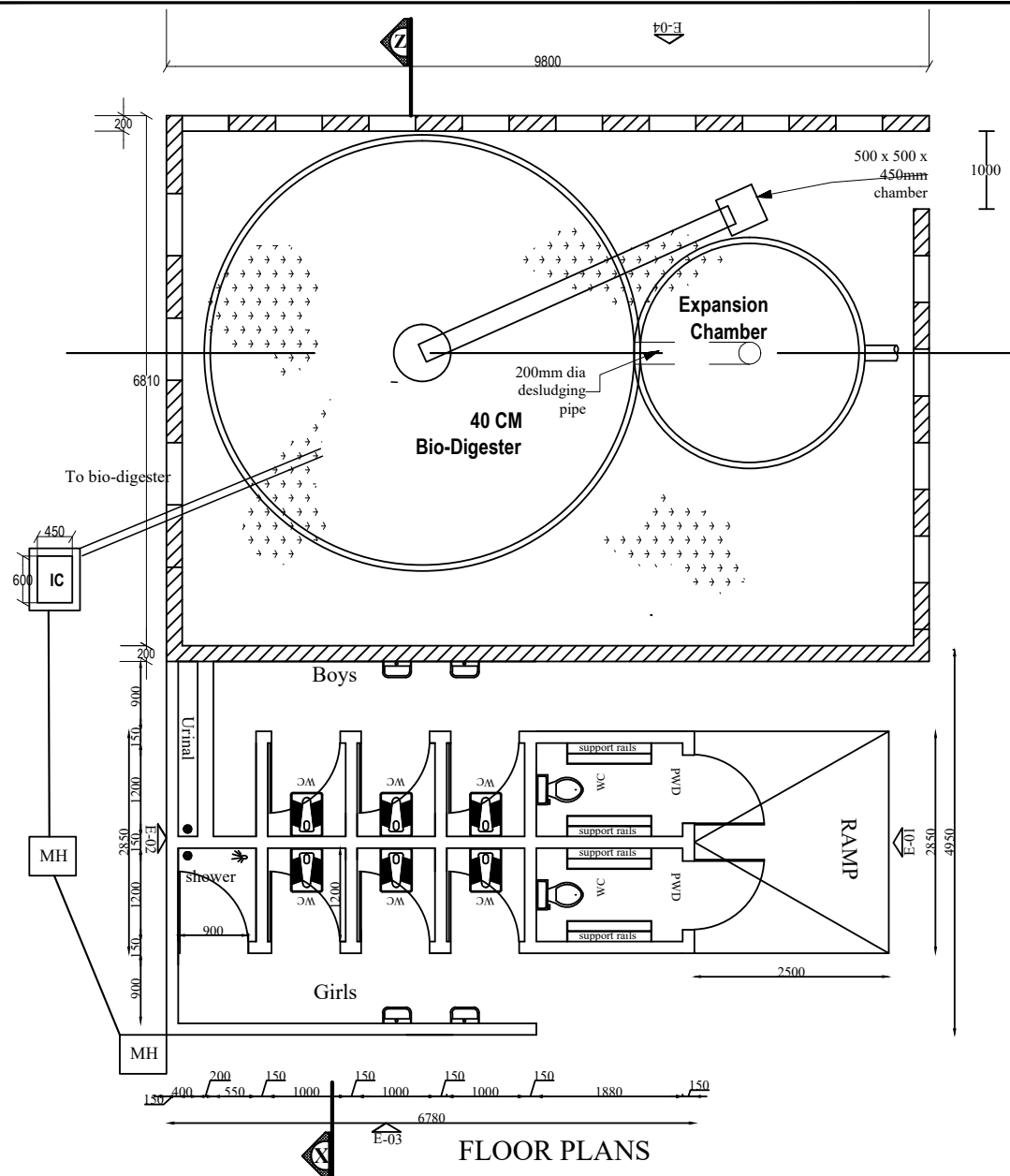
REMARKS:

SHEET NO. DATE: REV: NO: DESCRIPTION:



DATE	REV	NO	DESCRIPTION

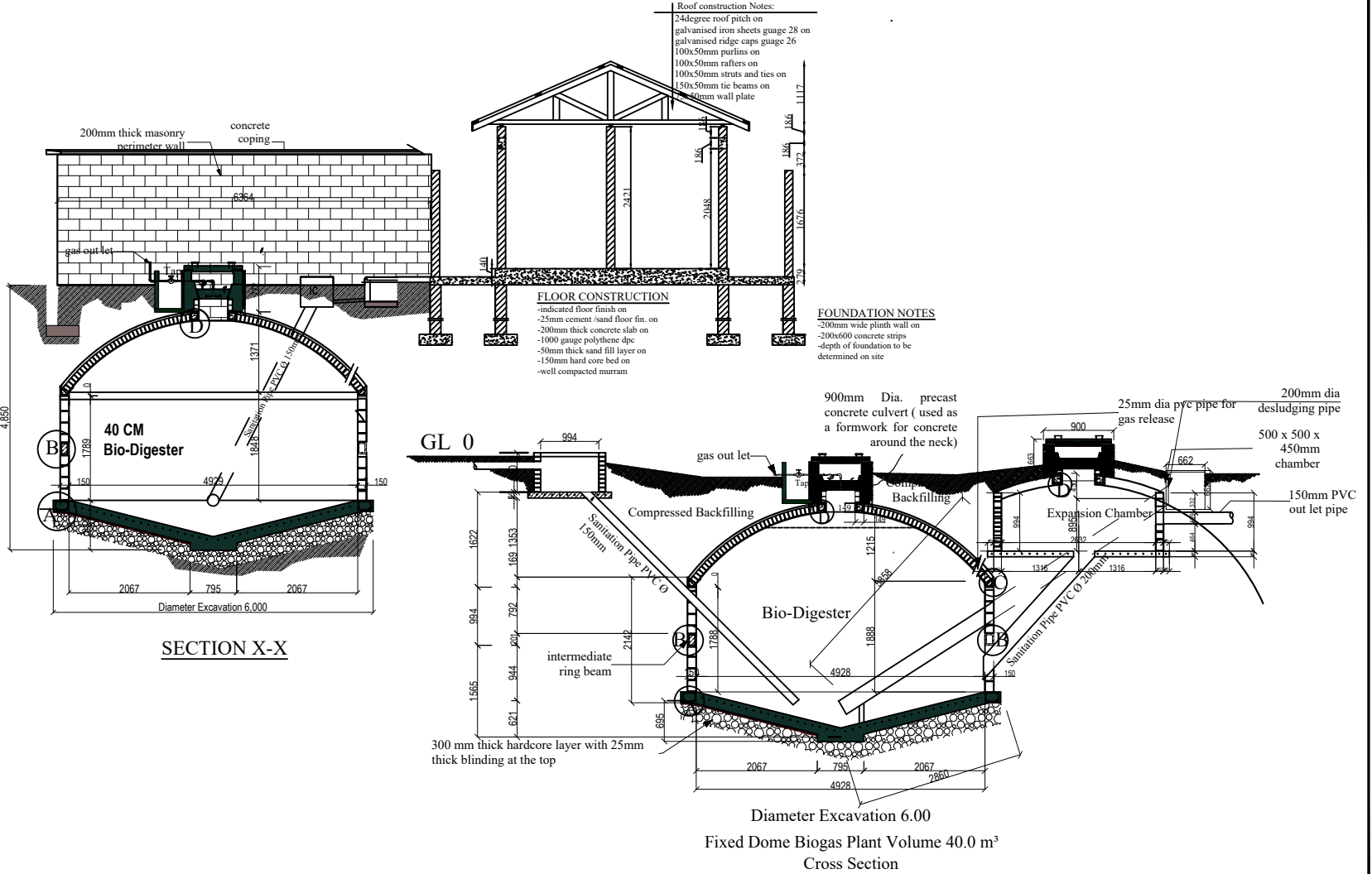
DRAWN BY: UNITS: (In Millimetres)

DATE: SCALE:



FLOOR PLANS

<p>NOTES</p>	 <p>KCCA KAMPALA CAPITAL CITY AUTHORITY Kampala - Entebbe - Gulu</p>	 <p>Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra</p> <p>Swiss Agency for Development and Cooperation SDC</p>	 <p>german cooperation giz Global Infrastructure & Services Cooperation 2012-2016</p>	<p>MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.</p> <p>DRAWING TITLE SCHOOL BIO LATRINE PLAN AND SECTIONS</p>	<p>SCALE: As Shown</p> <p>SURVEYED: AK</p> <p>DESIGNED: AK</p> <p>DRAWN: LM</p> <p>CHECKED: AK</p> <p>APPROVED:</p>	<p>DATE: APRIL 2016</p> <p>DRG. No.: SD/INST/BG/01</p>
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NOTES



MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

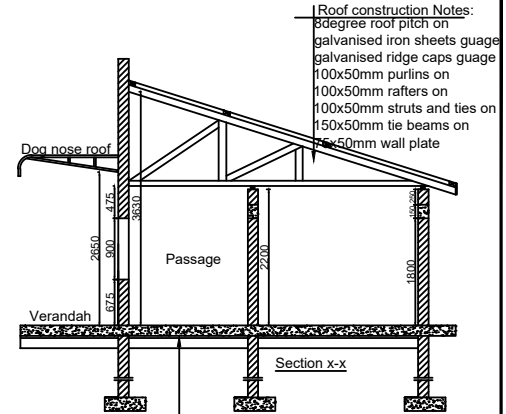
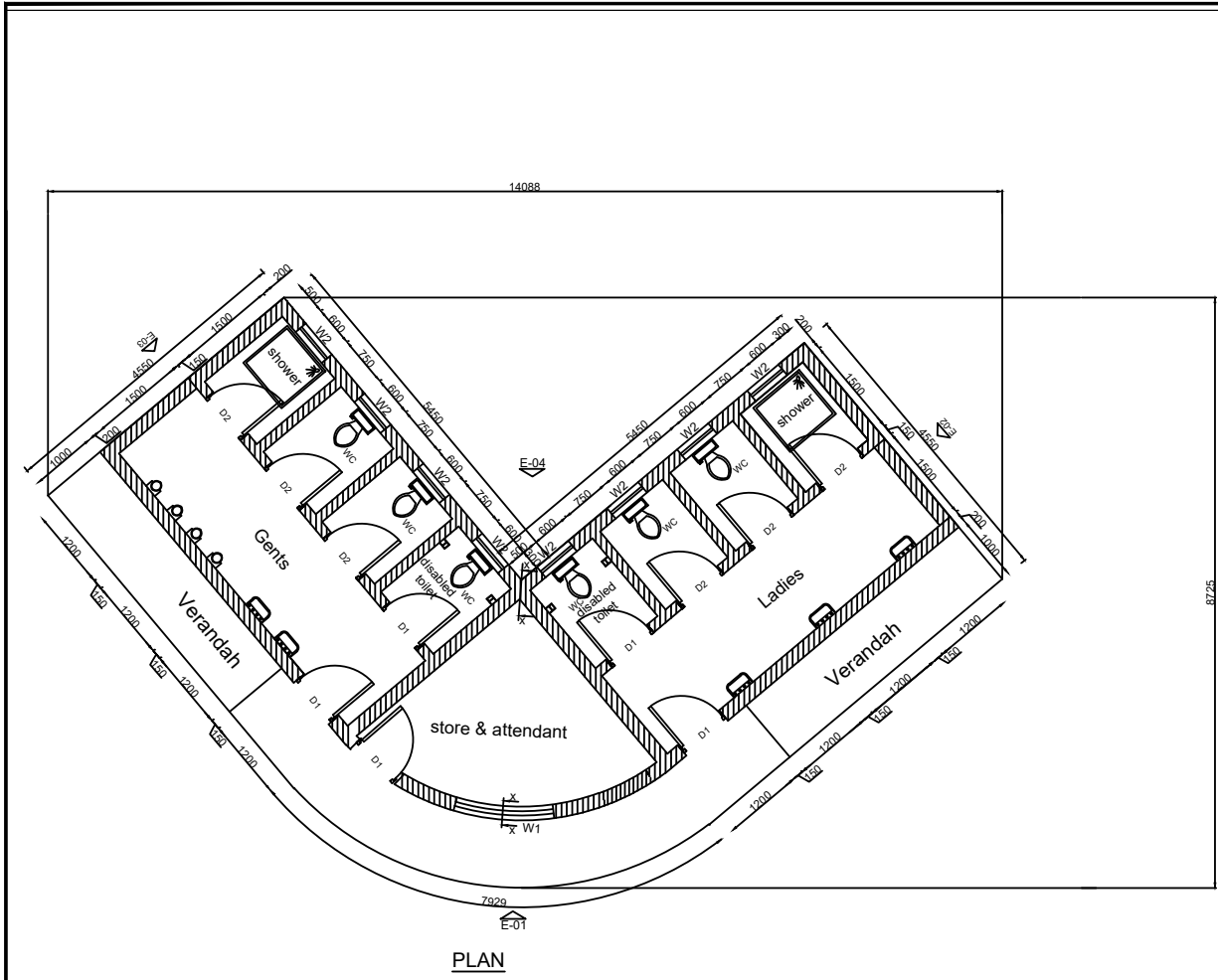
DRAWING TITLE
SCHOOL BIO LATRINE SECTION

SCALE:	As Shown
SURVEYED:	
DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

DATE:	APRIL 2016
ORG. No.:	SD/INST/BG/02

PUBLIC TOILETS

Water Closets (WC)

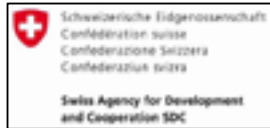


Roof construction Notes:
 8 degree roof pitch on
 galvanised iron sheets guage
 galvanised ridge caps guage
 100x50mm purlins on
 100x50mm rafters on
 100x50mm struts and ties on
 150x50mm tie beams on
 75x50mm wall plate

Foundation Notes:
 150mm concrete floor slab bed on
 200mm approved hardcore on
 well compacted murram filling into
 230mm plinth wall laid on
 690x230mm concrete foundation slab
 mix 1:3:6 on cement sand blinding
 mix 1:4:8
 depth of foundation to be determined
 on site to detail of structural Eng.

SECTION X-X

- NOTES**
- All dimensions are in mm unless stated otherwise.
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 - Structural details are not included.
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 - All mass concrete is Class 15/10.

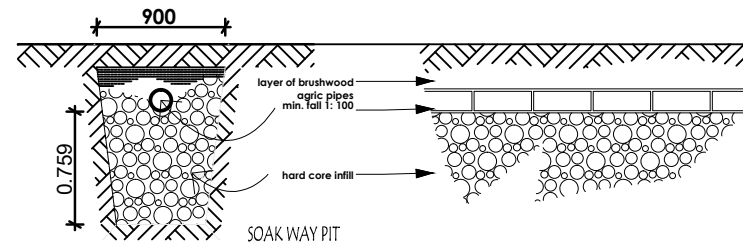
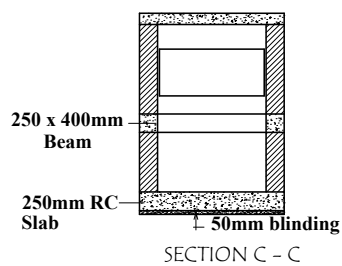
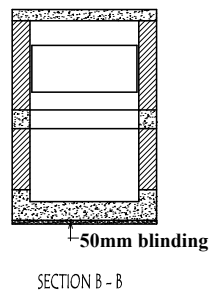
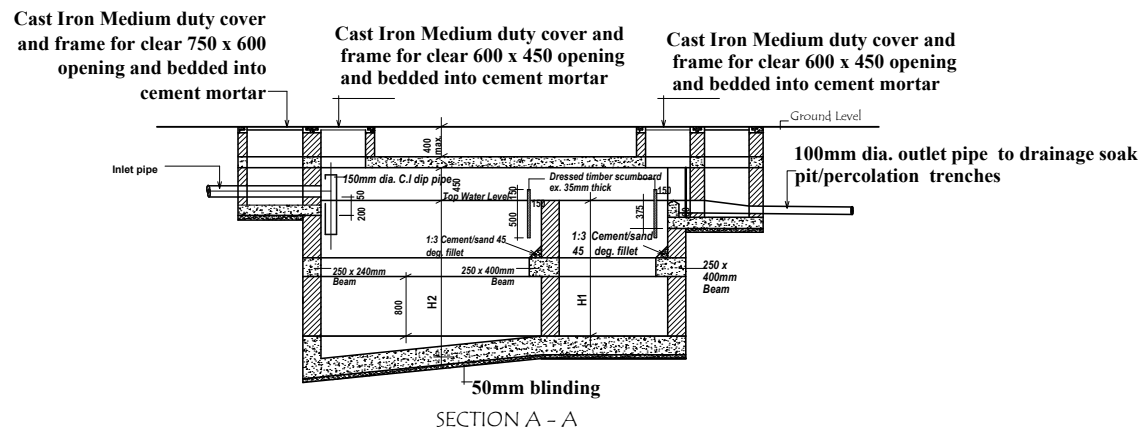
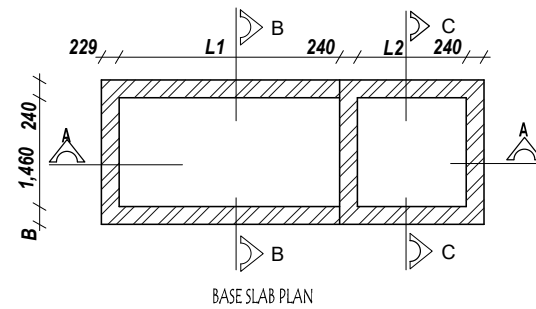
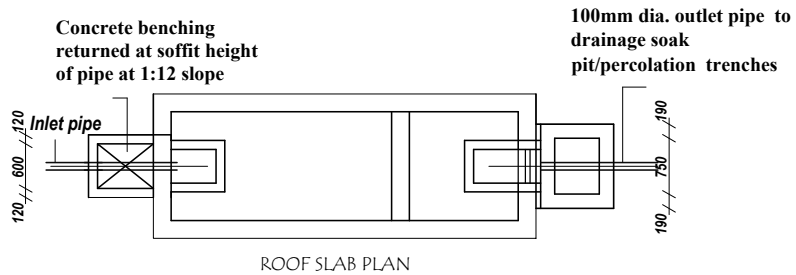


MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

DRAWING TITLE
PUBLIC TOILETS PLANS AND SECTIONS

SCALE:	1:100
SURVEYED:	
DESIGNED:	AK
DRAWN:	LMB
CHECKED:	AK
APPROVED:	

DATE:	APRIL 2016
DRG. No.:	SD/PUB/FT/01



NOTES



MINIMUM STANDARDS FOR SANITATION TECHNOLOGIES IN KAMPALA, UGANDA.

DRAWING TITLE
PUBLIC TOILETS
Septic Tank details

SCALE:	As Shown
SURVEYED:	
DESIGNED:	AK
DRAWN:	LM
CHECKED:	AK
APPROVED:	

DATE:	APRIL 2016
DRG. No.:	SD/PUB/FT/02



Implemented by:

