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Somalia WASH Cluster Guidelines

Latrine Design and Construction Part 1

PURPOSE

This document is to be used as a reference primarily by field staff and practitioners in the water and sanitation sector in Somalia while constructing latrines.

It doesn't endorse any specific design or plan but rather provide a list of key minimum requirements that should be respected when choosing a design for latrines in emergency.

The ideal design must be a compromise between the key public health role played by excreta management systems in emergency and the acceptance of the system by beneficiaries.

However, some suggested designs are provided at the end of the document. Irrespective, of the design chosen the latrine must provide an effective barrier to disease transmission.

INTRODUCTION

Lack of access to adequate and appropriate sanitation and hygiene poses a serious threat to public health. The practice of open defecation is a leading cause of fecal oral transmission of diseases with children being the most vulnerable. A safe and appropriate latrine accompanied by hand washing with soap, provides an effective barrier to transmission of diseases.

The provision of appropriate facilities for defecation is also an essential response for people's dignity, safety, health and well-being. To improve safe access to sanitation it is necessary to meet standards of privacy and safety using sanitation structures that are locally or culturally acceptable.

Several technical options are available to rapidly setup an excreta disposal system in emergency. The easiest and fastest options presented in this document are:

- Improved trench latrines
- Simple pit latrine (including with an offset pit)
- Ventilated Improved Pit (VIP) latrine

Separate documents are being developed for more complex options (poor flush with or without septic tanks) and latrine emptying/fecal sludge management.

MINIMUM STANDARDS/REQUIREMENTS

This section provides the minimum requirements that apply to any toilet/latrine system. Whatever the design selected, these are essential features for Somalia.

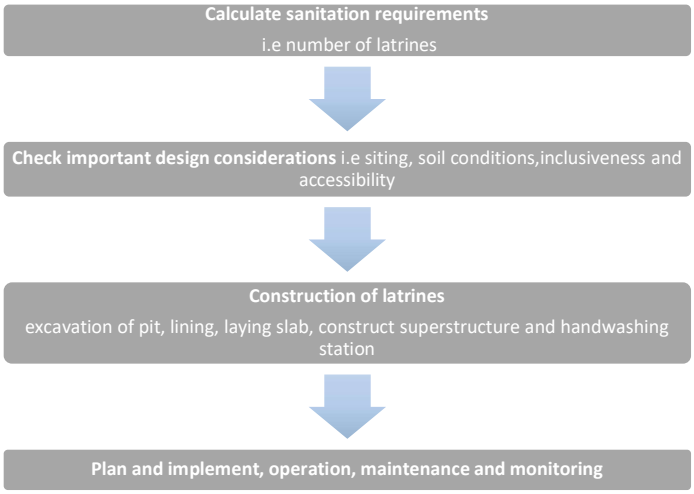
Coverage	Initial Phase of Emergency: Less than 50 persons (around 8 households) per latrine in dense target population (IDPs and dense urban contexts). As soon as possible (the later after 6 months): Minimum 1 Latrine per 20 persons (around 3 households) aiming for 1 latrine per household. Institutions: • School: Minimum of 2 toilets per school in separate locations (one for girls and one for boys), progressing to 1 toilet per 30 girls, and 1 toilet per 60 boys. • Health Facility: 1 toilet per 20 beds or 50 per outpatients – consider gender separation. • Feeding centre: 1 toilet per 50 adults and 1 toilet per 20 children – consider gender separation. • In all type of institutions, staff (health workers, teachers, etc.) may request for their own toilet. This as to be evaluated on a case by case basis. Trench Latrines: Maximum 100 people per toilet (cubicle) – consider gender separation.
Gender and protection	Build separate toilet for males and females. Make sure they are clearly marked in pictorial form for illiterate users and work with community to ensure they are used by the indicated gender. In exceptional circumstances, toilets are provided per group of households in such a way that it reduces risk of violence against users, especially women and children, and it facilitates proper maintenance. This option must be agreed in consultation with the community, including after consultation with group of women. Build latrines in safe location, as agreed with women and girls in the design phase. Women may prefer private locations for toilets – away from public view. This may be achieved by a screen or a fence in front of the toilet.

	The latrine must have a rigid door (wooden or iron sheet), lockable from inside and fixed on a solid frame to allow a minimum of privacy and security for the users, in particular women and children. Children should be able to use and reach door handles and locks. Install lights near communal facilities. If lighting is not possible, consider coordinating with NFI sector for the provision of solar lamps / torches for each household. At least 10% of the toilets must be adapted to disabled/elderly (based on needs identified).
Other design elements	Ensure that the bottom of pits is 1.5m above maximum groundwater table to avoid contamination. Provide appropriate handwashing facilities nearby the latrine that can be locally assembled and maintained. Ensure there is a proper drainage around the latrine and near the handwashing station to avoid any water logging in the vicinity. Allow for the disposal of women's menstrual hygiene materials with a separate bin with a cover/lid, or any other suitable option accepted by users to reduce flies' density. Minimize fly and mosquito breeding through: • Continuous backfilling of excreta (for trench latrine); • Provision of a well fitted lid (for simple pit latrine); • Provision of the appropriate ventilation system, drop-hole size, vent pipe diameter and mesh size for the net at the outlet of the ventilation pipe (for VIP system). If required, provide enough space for desludging services (vehicles and workers). If required, adapt the design to anal cleansing practices.
Siting of the latrine	Consult users (especially women and girls) on siting design and appropriateness of the latrine. Toilets should be located no more than 50m away from dwellings and at least 30 meters away from any groundwater source (unless the pit has been designed to contain excreta and reduce transfer to surrounding soil). Avoid areas prone to flooding as much as possible or select an appropriate design (either flood resistant and/or raised latrine).
Sizing and sludge	The below sludge accumulation rates apply for sizing the pits: • 0.5 l/p/day in initial phase of emergency;

accumulation rate	• 40 l/p/year in post-emergency situation; • 1.3 l/p/day when water is used for anal-cleansing; • 8-10 l/p/day in the initial phase and before washing areas are constructed (people may wash clothes and bath in latrines).
Operation and maintenance	Operation/Use: • Ensure users has been sensitized on the correct use, appropriate maintenance, hand washing and other basic hygiene practices; • Ensure users have been targeted by hygiene promotion campaign with hygiene kit distribution before using the toilets/latrines; • Ensure users understand the importance of having a functional hand washing facility (with soap and water) next to the toilet. Maintenance: • Establish and train WASH committee in Hygiene Promotion, use and maintenance of sanitation facilities; • Before the construction, agree on responsibility for cleaning, refilling handwashing water and hygiene promotion in community (e.g; rotation system between families for cleaning and refilling water. The WASH committee monitors implementation of maintenance activities, with pre-agreements on how to address possible lack of compliance); • Ensure that the slab and surroundings are cleaned every day (do not use disinfectant in large quantities as it may affect the bacterial degradation of the waste resulting in bad smells and the pit being filled faster); • Ensure surroundings of latrines are well drained; • Build community capacity and encourage them to de-sludge filled pits either by themselves (if trained and equipped) or through a dedicated service provider when required.

IMPLEMENTATION

The pathway to follow for excreta management is summarized below.



Technical options recommended for Somalia

Trench latrine (improved)

Trench latrines are often constructed in the immediate stage of an emergency. The recommended maximum length of trench is 6m with six cubicles. Trenches should be about 0.8m wide and the top 0.5m of the pit should be lined.

Wooden platforms can be used above the trench and covered with plastic sheeting and soil to reduce density of flies and odors.

Trench latrines are the minimum option for health facilities during acute emergencies if a slab is used to squat, with a lid to avoid breeding of flies in the trench. Depending on the expected duration of the emergency situation, improved trench latrines can be either deep, to serve up to six months, or shallow for a shorter period.

It is recommended to gradually replace trench latrines with a more elaborated design as soon as possible (e.g. simple pit, VIP, flush system, etc.). WASH practitioners must evaluate if the use of such design will provide gains in term of public health and safety or if the situation allows to wait for the construction of a more elaborated design.

Backfill the trench with 100mm of soil every day to reduce smell and flies.

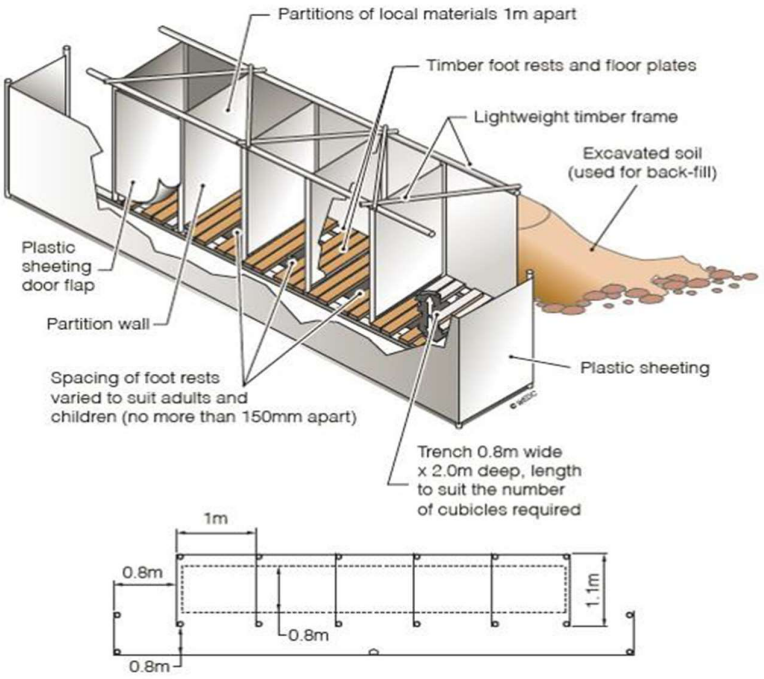


Figure 1: typical design for a trench latrine

Key design parameters for the deep trench latrine includes:

- Trench:
  - 0.8m wide, 2m deep, 1m length per 1 cubicle;
  - Recommended that the top 0.5m is lined to ensure it remains stable (up to 1m in unstable soil conditions such as sandy soils);
  - Recommended materials include concrete, bricks, blocks or sandbags;
  - Keep backfill soil nearby to allow covering of excreta at regular intervals.

- Slabs:
  - Slabs should be at least 1.1m length to cover a 0.8m wide trench;
  - Recommended materials include timber, plastic and concrete where possible

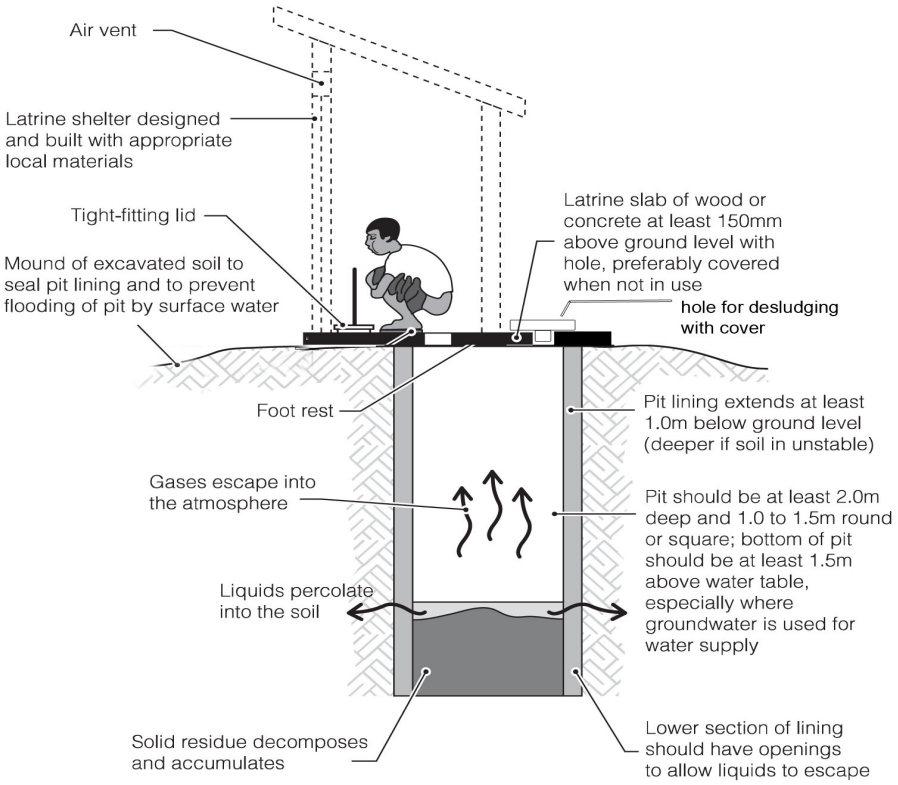
- Superstructure:
  - Cubicle should be 1m long along the trench and 2m high;
  - Recommended materials include timber for the frame, and plastic sheeting as a minimum for the walls to provide privacy;
  - Cubicle will be hot due to local climate; ventilation should be included;
  - Ensure a roof is provided where possible;

<u>Simple Pit Latrines</u>

Simple pit latrines are inexpensive, simple and quick to construct. It is the most adapted and adopted technology choice in emergency situations.

Construction/design/maintenance tips

- Composed of a large hole (pit) in the ground covered by a squatting plat or a platform with a hole through which the users excrete. The platform is surrounded by a screen to provide privacy and shelter for the weather.
- There should be a cover for the hole to reduce odors and keep flies away.
- There should be a hand washing point nearby the facility.
- Ideally the emergency family pit latrine is for a single family. However, WASH Cluster recommends sharing the pit latrine where possible by up to three families (20 people).
- A pit is considered full when the contents are within 0.5 m of the surface, or 0.2 m in acute emergency situation;
- For sizing purpose, it is correct to consider a solid accumulation rate of 0.5 l/p/day in emergency situation and 40 l/p/year in post-emergency situation. These figures are only indicators and can vary significantly depending on anal cleansing practices, intensity of use of the latrine and soil conditions;
- Soils liable to collapse should be supported by a lining. In particular, the upper part of the pit is important as it will support the cover slab;
- The slab is placed directly on the top of the pit about 15 cm above the surrounding ground level to prevent surface water from entering the pit;
- The type of squatting slab to be used will entirely depend on how quick the slab can be fabricated /procured and delivered to the site. The slab of any materials such as plastic, fiber, wood or concrete is acceptable if they are sturdy and can be cleaned easily;
- The squatting hole should be provided with a lid for safety, to reduce odor and to help prevent flies from breeding in the pit. Flies and smell tend to be more of a problem in shallow pits containing water than deep ones that are dry;



(**Source of picture**: (Harvey, P. (2007). **Excreta disposal in emergencies**. WEDC); Picture adjusted by offsetting the pit and including desludging hole with cover)

- The latrine must have a rigid door (wooden or iron sheet), lockable from inside and fixed on a solid frame to allow a minimum of privacy and security for the users, in particular women and children;
- Adding wood ashes to the pit may result in perceptible odor reduction and might accelerate the elimination of pathogens in the pit. Lime also reduces the smell but might slow down the decomposition process;
- Latrine with an offset pit (not located under the slab) is a design largely spread in Somalia. The pipe should be fixed with an angle of 45° at least with a minimum diameter of 150mm, and made of PVC preferably. This design will reduce the volume available in the pit for excreta accumulation and this constraint must be considered in the design phase. All other design considerations apply and the fitting of the cover/lid is critically important as excreta may stick on the pipe resulting in attracting flies. A simplified flushing may be considered to clean the pipe after each use.

<u>Ventilated Improved Pit Latrine (VIP)</u>

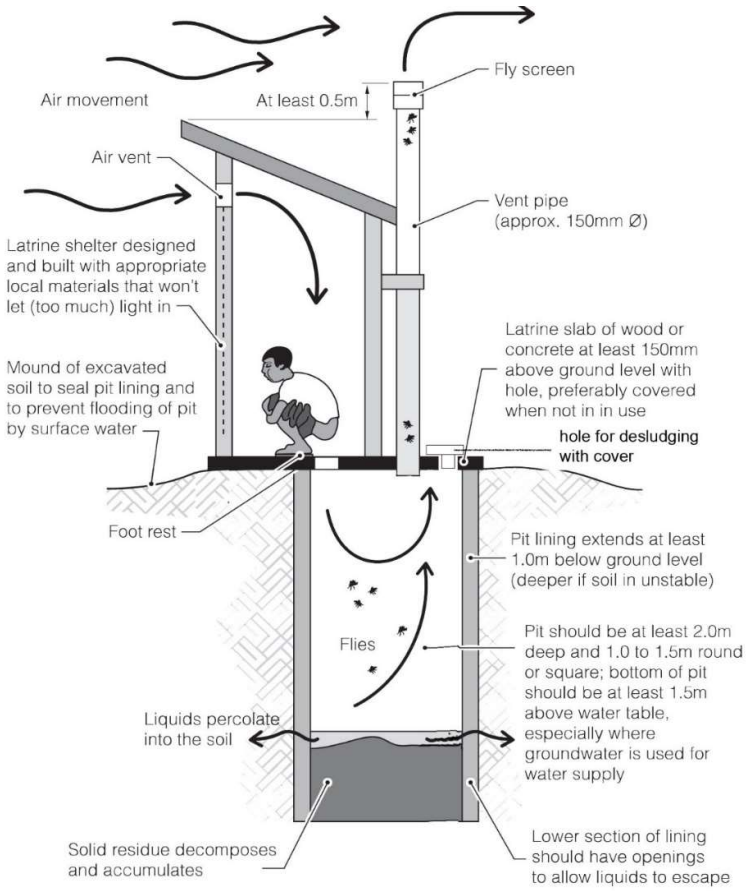
The Ventilated Improved Pit (VIP) latrine is designed to minimize odors and flies. It comprises of a pit, a cover slab, a superstructure and a well-fixed vent pipe with fly trap/screen. The principle of operation is that a continuous flow of air comes in through the superstructure and enters the pit through the hole. This airflow will go down into the pit displacing (pushing

up) the hot smelly air upward through the vent pipe. A darkened interior is maintained causing insects entering the pit to be attracted towards the light at the top of the vent pipe and trapped by the fly screen.

VIP latrine has a complicated design where functioning principles must be strictly respected in order not to compromise the ventilation working principle. Often such strict design compliance is a challenge in emergency responses and should be avoided if technical expertise is not present within the implementing organization.

Construction/design/maintenance tips:

- Do not use a cover on the defecation hole of a VIP latrine as this would stop the air circulation needed for the ventilation.
- The doors of the VIP superstructure should be self-closing. Above each door should be an air hole for ventilation purpose. This air hole should have a surface at least three times larger than the cross-sectional area of the ventilation pipe, and be covered with a UV resistant screen (e.g. mosquito net).



(**Source of picture:** (Harvey, P. (2007). **Excreta disposal in emergencies**. WEDC); Picture adjusted by offsetting the pit and including desludging hole with cover)

- For VIP latrine batteries, the separation in individual pit compartments by solid walls going from the bottom until the top of the pit is needed to avoid cross-ventilation of the air movement between the different defecation holes, which would hamper the VIP ventilation principles. This means as well that every single compartment of the VIP latrine battery should have its own ventilation pipe.
- Each ventilation pipe should be vertical, sticking out above the latrine's roof by at least 0.5m. The hole where the vent pipe comes through the roof should be made water tight to avoid leaks. To ensure a better anchorage of the plastic vent pipe at the bottom, a clamp can be connected at the level where it will be mortared in the slab.
- When PVC pipes are used as a vent pipe, their diameter should ideally be 150mm and at least 110mm. Having a dark colored vent pipe at the outside of the superstructure and oriented towards the sun might allow a better ventilation of the latrine during wind still days, but complicate the construction.
- The fly screen on the top of the vent pipe must be stainless steel, aluminum or PBVC coated fiberglass, because the gasses escaping from the latrine are very corrosive to mild metal. If really nothing else is available, painted metal mesh is the last option.

Other general technical design/construction tips

Alternate pit option	Depending on the context, alternate options are available for latrine pits: • Temporary pits: lined with 3-4 interconnected drums. Drums placed on top of each other with opened tops and bottoms. Can be perforated to allow liquid infiltration; • Twin pits: each toilet is connected to two pits, with one pit to be filled at a time. This design is safer to desludge, as sludge is safer to remove after 1.5 year of rest. If pits are shared, this design requires 4 pits (or more) rather than 2. • Longer term locations: double pit latrine, (poor-) flush systems with (or without septic tanks are designed to be considered (refer to specific guidelines).
Lining	The latrine pit must be lined in soft soils to avoid the walls to collapse, with bricks or stones. It must be open-jointed (honey comb) to allow infiltration of liquid in the surrounding soil and exchanges between the inner and the outer parts of the pits (allow a proper waste decomposition and micro-organism activity in the pit). If bricks or stones are not available, perforated corrugated iron sheets, installed vertically and overlapping each other partly can be used. The perforation can be done by drilling small holes or by means of a hammer and a pointed chisel.
Bathing	Bathing in toilet/latrine to be restricted as much as possible to avoid pits filling too quickly. If a bathing facility is installed at proximity of a

	latrine, ensure that grey water is drained towards a soak away pit properly sized.
Pit cover (slab)	Pit must be covered with a slab that can be removed for desludging. Ideally, the slab could have a small manhole (600mm squared) easier to open. Both the slab and the manhole should have a perfect sealing to restrict access by flies and mosquitoes.
Pit depth	The recommended depth is 3m. However, in some circumstances, and if water table is deep, pit as deep as 10-12m is possible (in suitable soils, e.g. central Somalia). If required, the latrine can be raised by 1m or more above the ground level to increase the pit volume. The bottom of the pit should be at least at 1.5m above the highest water table.
Water supply	If possible, provide a dedicated water supply system (e.g. tank above the latrine, linked to the main water network). Dedicated drainage to a soak-away pit is required to avoid the latrine pits to overflow with grey water. This is especially important for women to wash menstrual hygiene items.
Cleaning and maintenance	To facilitate cleaning and maintenance operation, sanitation toolkits can be provided, with below recommended composition: • Wheelbarrow (x1) • Pick axe (x1) • Shovel / spade (x2) • Brooms (x4) • Rakes (x2-4) • Rope and bucket (to empty pit)
Latrine rehabilitation	Rehabilitated latrine must fully comply to the minimum requirements referred to in this document. Type and cost for rehabilitation must be evaluated using the minimum requirements and decision taken if the latrine must be decommissioned or rehabilitated. Depending on the design, various latrines may require different forms of rehabilitation. During rehabilitation, Health and Safety Procedures must be followed and might therefore require that laborers involved are trained to prevent contamination. The same should be the case for frog men who help in latrine emptying or desludging.
Latrine decommissioning	Decommissioning of latrine that poses a risk to environment and/or a water source is implemented following the below: • Carry out latrine closure during dry season; • Remove all structure from above the pit; • Dig an overflow trench from top of pit or tank to absorb displaced fluids; • Smash or crack the lining that are accessible; • Fill the pit with rubble and organic matter until the pit is nearly full; • Backfill trench with soil and rubble;

	• Cap the pit with a large mound of soil and rubble to allow for further settling of contents. Threes may also be planted.

MONITORING

The below check list is used to monitor a sanitation system at field level and ensure it fulfill its minimum requirements to reduce the burden of WASH-related morbidity/mortality and the risk of contamination to the surrounding environment without posing a threat to the users, especially women and children.

#	*Items/questions*	*Yes*	*No*
1	The number of users per toilet/latrine is per the Somalia cluster' recommendations: • Less than 50 persons (around 8 households) per latrine in dense target population (IDPs and dense urban contexts) in acute emergency phase • Minimum 1 Latrine per 20 persons (around 3 households) aiming for 1 latrine per household after the acute emergency phase		
2	All toilet/latrine are located at least 30m away from all sort of groundwater sources.		
3	Bottom of toilet/latrine pits are dug at least 1.5m above water table in locations where shallow aquifer are used for drinking purposes.		
4	At least 10% of the toilet/latrines are designed to respond to need of disabled and/or elderly.		
5	Communal toilets/latrines are gender separated (not needed for household toilets/latrines) and lighted at night and equipped with lockable doors to minimize unwanted intrusions.		
6	All toilets/latrines are equipped with a functional handwashing point with soap or an alternate system to ensure hand washing with soap following use of the facility.		
7	Density of flies is minimized through appropriate technical design: • Trench: well fitted lid/cover and surface slab • Simple pit: well fitted lid/cover (ideally replaced by foot) • VIP: proper ventilation system as recommended in the above guidelines		
8	All toilets/latrines are in used, well maintained and a cleaning/maintenance mechanism has been put in place in consultation with the community.		

9	Users, especially women, have been involved in the selection of toilet/latrine design and the location to construct the latrine.		
10	Users have been sensitized/explained how to use the facility, handwashing with soap and protection of food against flies.		

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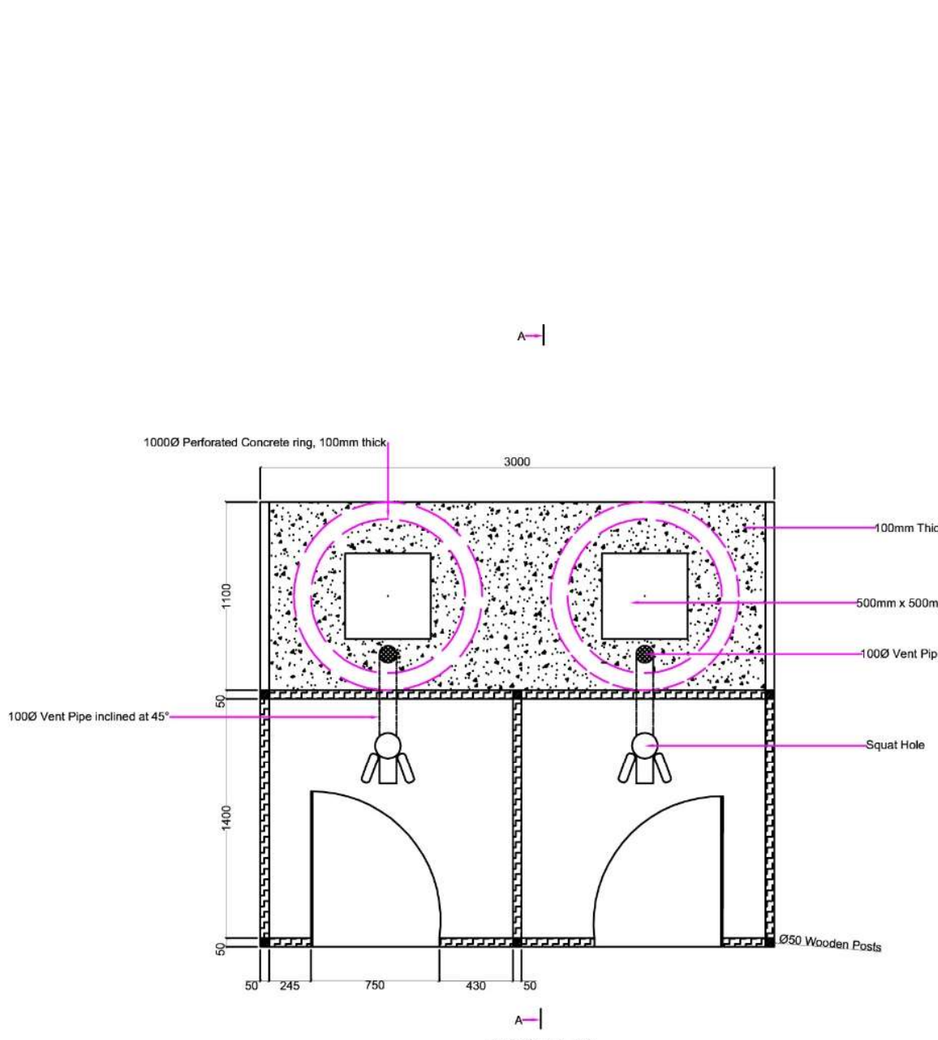
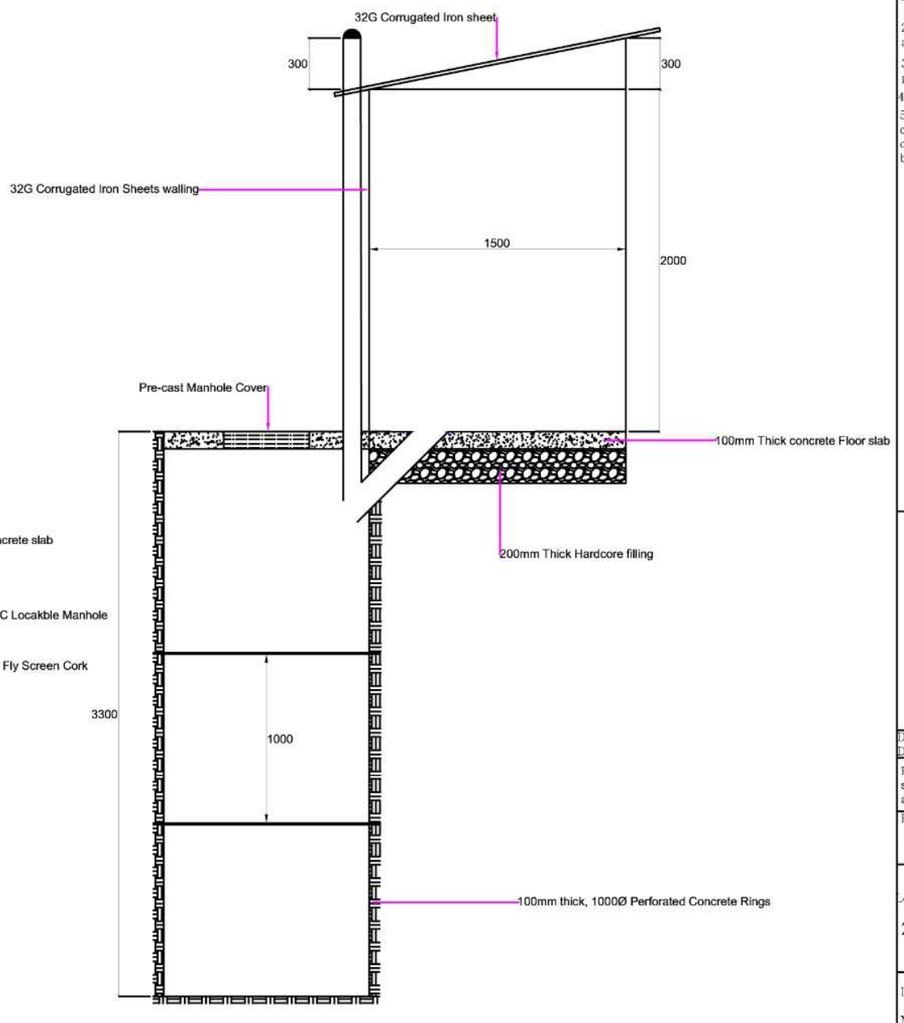
Annex 1

Example of toilet designs



FLOOR PLAN



Section A-A

NOTES

1. All dimensions are in MM unless stated otherwise
2. The Pit bottom should be atleast 1500mm above ground water level
3. Ramp to be constructed at the door for the physically challenged households
4. The concrete rings should be perforated
5. In the areas where space is a limitation due t congestion, the superstructure can be constructed on top of the concrete rings but leaving the manhole on the outside.

NRC
NORWEGIAN REFUGEE COUNCIL

Drawing Title:
Desludgable Pit Latrine Design

Project: Provision of appropriate Water, sanitation and Hygiene information and support to IDPS in Somalia

Funded by:
Common Humanitarian Fund (CHF), Somalia

Location:
ZONA K IDP Camp

Designed and Drawn by:

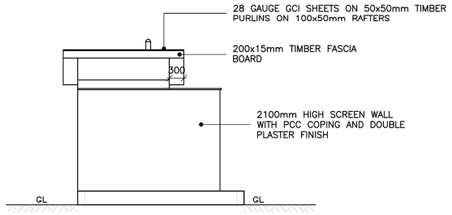
Mutuku Muema,
WASH Manager, South and Central Somalia
mutuku.muema@nrc.no

Scale:
1:50

Drawing No:
NRC/CHF/2012/13/002

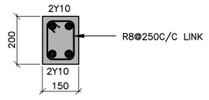
BOQ for VIP latrine (by NRC)

BOQ for 2-stance communal latrine with concrete rings					
Item	**Description**	**Unit**	**Quantity**	**Rate in US$**	**Total in US$**
	Sub-structure				
1	Excavation of pit hole	M3	18		
2	Portland cement, 50kg	Bags	10		
3	Sand	M3	0.57		
4	Gravel	M3	0.7		
5	Iron bar, 8mm	ql	0.09		
6	Heavy wood columns	No	2		
7	Plywood (flexible) (1.2x2.4m)	No	12		
8	10 cm/4 inches diameter PVC pipe for ventilation	Pcs	1		
9	Water	Drum	4		
	Super-structure				
1	Heavy wood columns (10 cm x 3 m length)	No	6		
2	Wood timber (2.5 cm x 5 cm x 4 m)	No	17		
3	Corrugated iron sheet (G34)	Pcs	19		
4	Door hinges	Pcs	4		
5	Door locks (tower bolts)	Pcs	4		
6	Nails (roofing and ordinary)	Kg	4		
7	Branding/labelling/painting	Pcs	1		
	Other				
1	Labor cost	LS	1		
2	Empty metallic drums with well-handled (half-cut)	No	1		
3	Security provision	LS	1		
	Sum Total (2-stance)				
	1-stance				



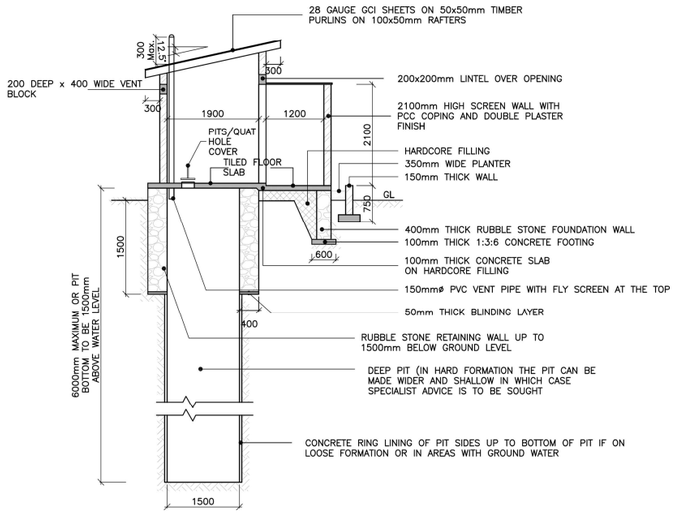
FRONT ELEVATION

SCALE 1:50



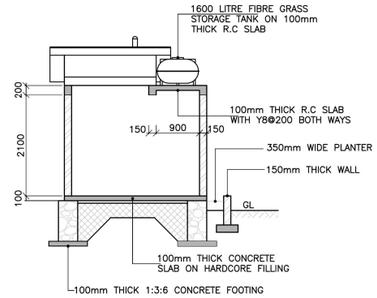
LINTEL BEAM RC DETAILS

SCALE 1:5



SECTION A–A

SCALE 1:50

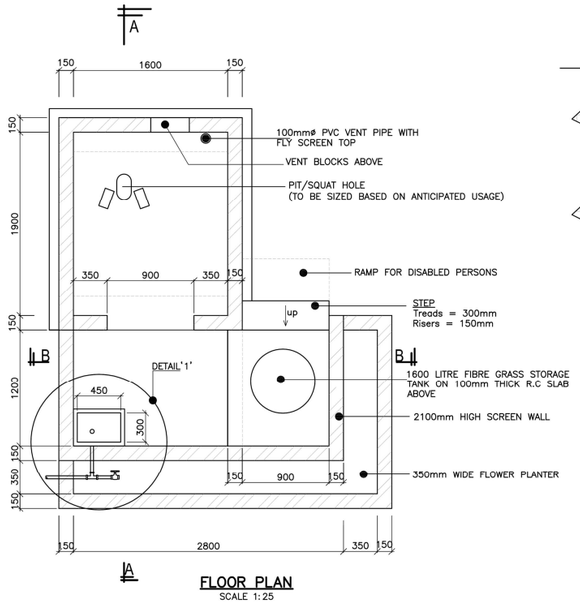


SECTION B–B

SCALE 1:50

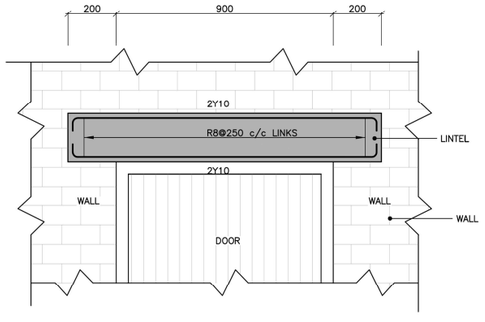
NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. THE RUBBLE STONE WALLING TO BE JOINTED WITH CEMENT/ SAND MORTAR.
3. THE PIT BOTTOM SHOULD BE 1500mm MINIMUM ABOVE WATER LEVEL.
4. ROOF TRUSSES TO BE MADE OF SEASONED CYPRUSS TIMBER OR EQUIVALENT APPROVED CONFORMING TO APPLICABLE LOCAL AND/OR BS STANDARDS.
5. THE PIT SIZE HAS BEEN SIZED BASED ON AN AVERAGE SLUDGE ACCUMULATION RATE OF 60 LITRES/PERSON/YEAR.
6. IN LOOSE FORMATIONS AND/OR AREAS WITH GROUND WATER SUPPLIES THE PIT SHOULD BE LINED TO THE BOTTOM.
7. STRUCTURAL CONCRETE SHALL BE CLASS 25/20 WHILE BLINDING CONCRETE SHALL BE CLASS 15 /20 UNLESS NOTED OTHERWISE.
8. THE FLOOR SLAB SHOULD BE FINISHED WITH 30mm OF CEMENT:SAND (1:4) PAVED STEEL TROWELLED FINISH TO RECEIVE CERAMIC OR EQUIVALENT APPROVED TILES.
9. RAMP TO BE CONSTRUCTED AT THE ENTRANCE INSTEAD OF STEPS FOR DISABLED PERSONS USE



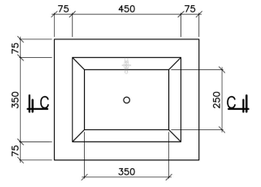
FLOOR PLAN

SCALE 1:25



LINTEL BEAM RC DETAILS

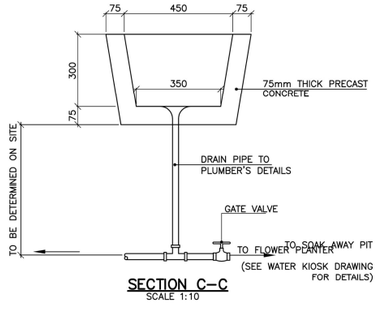
SCALE 1:5



DETAIL '1'

HAND WASHING CONCRETE BASIN PLAN

SCALE 1:10



SECTION C–C

SCALE 1:10

FINAL ISSUE

Signed: SLM/DOO _____

REV	REVISIONS	SIGN	DATE	APPROVED
	BY			
	CHECKED			
P2	STAKEHOLDER'S COMMENTS — BY	SNN	JUL'11	
	INCORPORATED — CHECKED			
P1	CLIENT'S COMMENTS — BY	PMN	OCT'10	
	INCORPORATED — CHECKED			
P0	PRELIMINARY — CHECKED	PMN	APR'10	
	BY			

Client

UNICEF – SOMALIA SUPPORT CENTRE

Project

PREPARATION OF STANDARD DETAILS MANUAL FOR WATER SUPPLY AND SANITATION FACILITIES IN SOMALIA

Civil/Structural Engineers

Howard Humphreys(EA) Ltd
Consulting Engineers.
HOWARD HUMPHREYS HOUSE
MUTHANGARI DRIVE
P.O.Box 30156–00100, NAIROBI
Phone 4440254/6, 4441835
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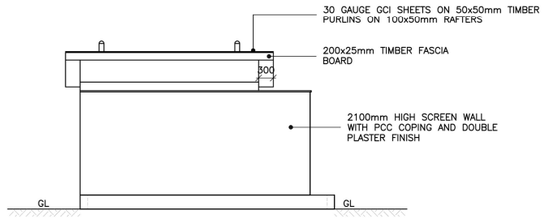
Drawing Title

SINGLE PIT LATRINE DETAILS

Designed by MKG	Drawn by PMN
Checked by	Approved by
Scale AS SHOWN	Date APRIL 2010
Job No. 1.0335	ACAD File: C–D–020–P2
P STATUS	DRAWING No. USOM/C/D/020 P2 REV



FRONT ELEVATION

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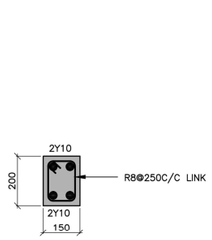
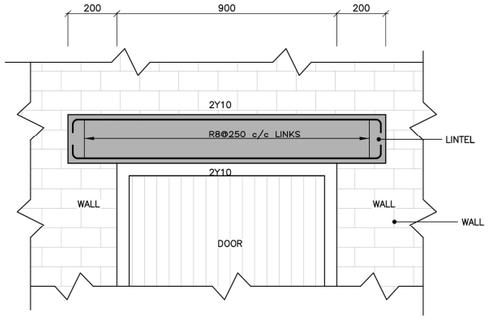


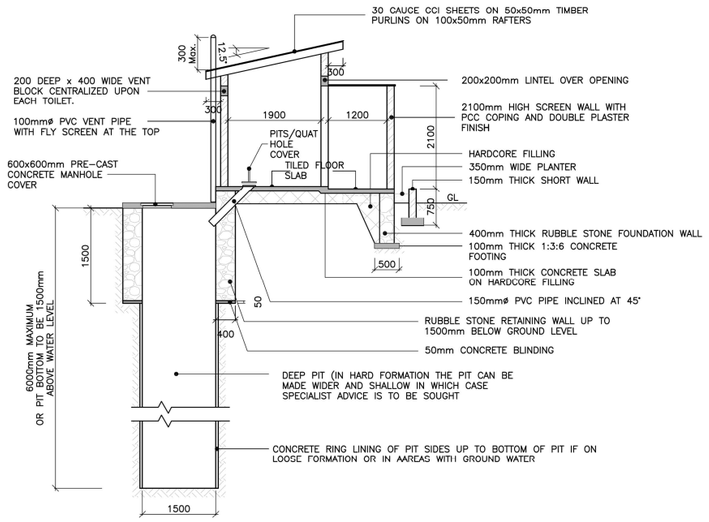
LINTEL BEAM RC DETAILS

SCALE 1:5



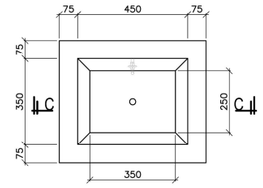
LINTEL BEAM RC DETAILS

SCALE 1:5



SECTION A–A

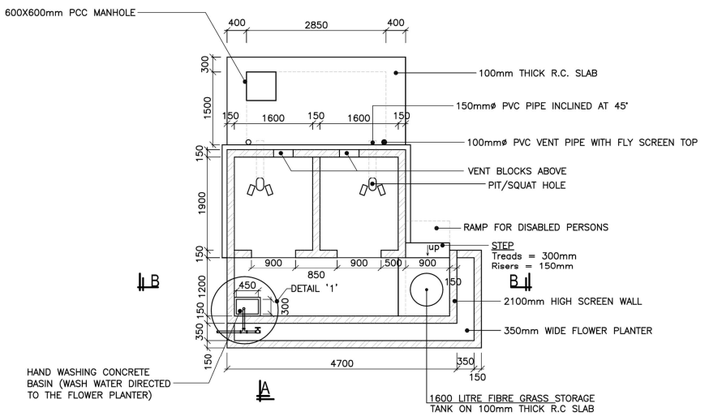
SCALE 1:50



DETAIL '1'

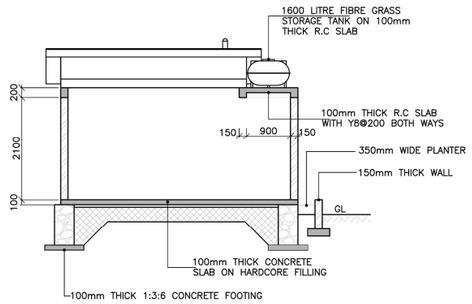
HAND WASHING CONCRETE BASIN PLAN

SCALE 1:10



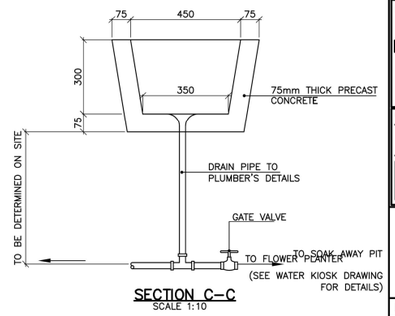
FLOOR PLAN

SCALE 1:50



SECTION B–B

SCALE 1:50



SECTION C–C

SCALE 1:10

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. THE RUBBLE STONE WALLING TO BE JOINTED WITH CEMENT/ SAND MORTAR.
3. THE PIT BOTTOM SHOULD BE 1500mm MINIMUM ABOVE WATER LEVEL.
4. ROOF TRUSSES TO BE MADE OF SEASONED CYPRUSS TIMBER OR EQUIVALENT APPROVED CONFORMING TO APPLICABLE LOCAL AND/OR BS STANDARDS.
5. THE PIT SIZE HAS BEEN SIZED BASED ON AN AVERAGE SLUDGE ACCUMULATION RATE OF 60 LITRES/PERSON/YEAR.
6. IN LOOSE FORMATIONS AND/OR AREAS WITH GROUND WATER SUPPLIES THE PIT SHOULD BE LINED TO THE BOTTOM.
7. STRUCTURAL CONCRETE SHALL BE CLASS 25/20 WHILE BLINDING CONCRETE SHALL BE CLASS 15 /20 UNLESS NOTED OTHERWISE.
8. THE FLOOR SLAB SHOULD BE FINISHED WITH 30mm OF CEMENT:SAND (1:4) PAVED STEEL TROWELLED FINISH TO RECEIVE CERAMIC OR EQUIVALENT APPROVED TILES.
9. RAMP TO BE CONSTRUCTED AT THE ENTRANCE INSTEAD OF STEPS FOR DISABLED PERSONS USE

FINAL ISSUE

Signed: SLM/DOO _____

REV	REVISIONS		SIGN	DATE	APPROVED
		BY			
		CHECKED			
P2	STAKEHOLDER'S COMMENTS	BY	SNN	JUL'11	
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Client

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P.O.Box 30158–00100, NAIROBI
Phone 4445254/6, 4441835
Fax 4440299

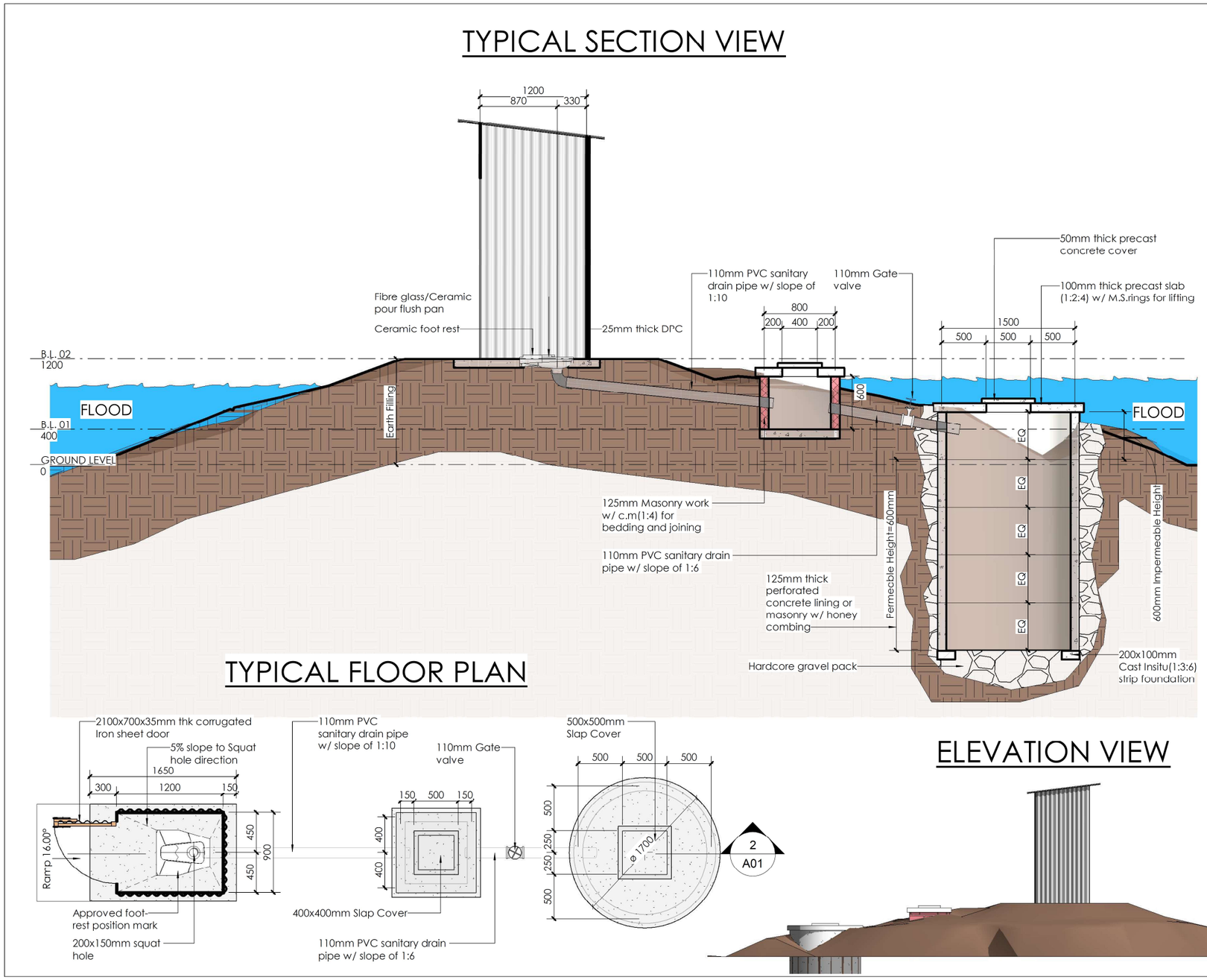
Drawing Title

TWIN PIT LATRINE DETAILS

Designed by MKG	Drawn by PMN
Checked by	Approved by
Scale AS SHOWN	Date APRIL 2010
Job No. 1.0335	ACAD File: C–D–021–P2
P STATUS	DRAWING No. USOM/C/D/021 P2 REV

Annex 2

Example of design for flooded area



PROJECT: PROPOSED TWO-TANK LATRINE FOR FLOOD PRONE AREAS

LOCATION: SOMALIA/LAND

CLIENT:

DANISH REFUGEE COUNCIL (DRC)

DRC Horn of Africa & Great Lake Region
P.O. Box 14762 00800 Westlands Nairobi, Kenya.
Tel: +254 204180403/4/5 Fax: +254 204180406
E-mail: lugardogaro@drcsomalia.org
www.drc.dk

SUBJECT: TWO TANK LATRINE FOR FLOOD PRONE AREAS

DESCRIPTION: PIT LATRINE PLAN, ELEVATION AND SECTION VIEW

REV	DESCRIPTION	BY	DATE

STATUS: NEW CONSTRUCTION

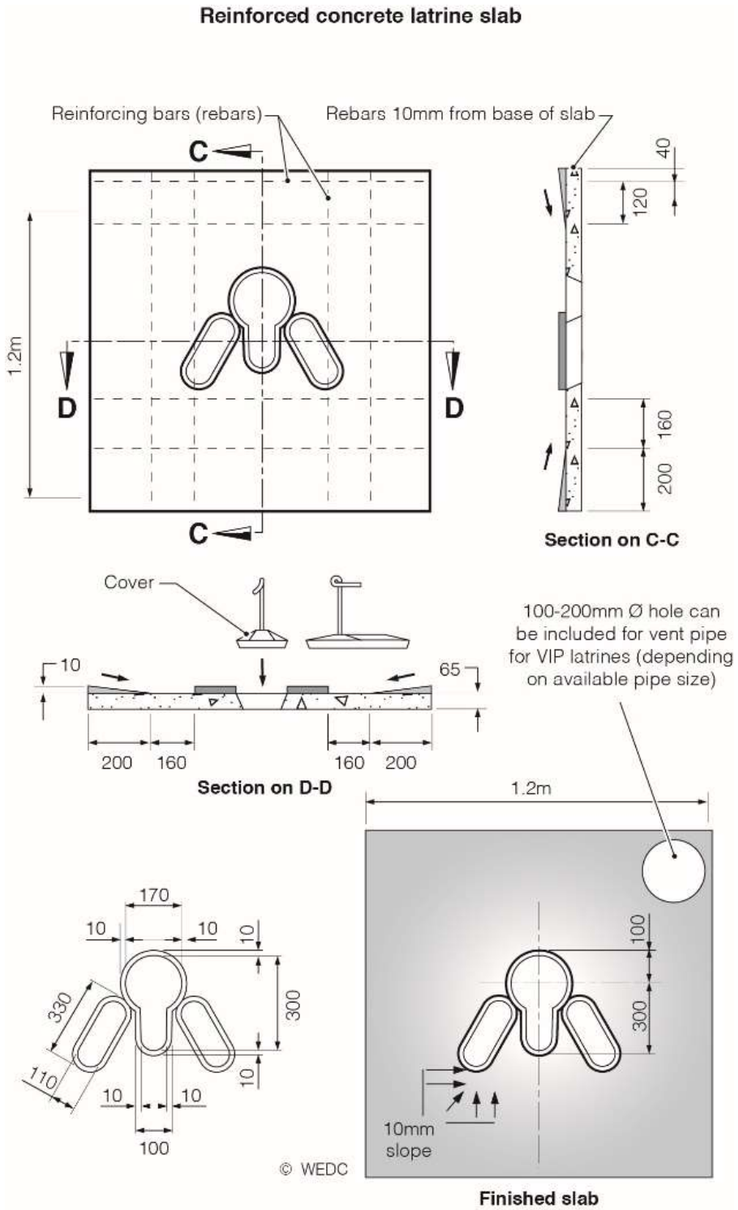
DRAWN BY: DRC ENGINEERS

STANDARDISATION: LUGARD OGARO

A

SCALE AT A3:	DATE:	
As indicated	11/11/18	
PROJECT NO: 01	DRAWING NO: A01	REVISION:

Annex 3
Latrine slab



Annex 4

List of designs and drawings available via WASH Cluster

- NRC IDP dislugeable latrine design
- UNICEF single pit latrine
- UNICEF twin pit latrine
- UNICEF triple pit latrine
- UNICEF IDP camp latrine
- Flood-proof sanitary latrine
- Latrine in IDP camps block
- Latrine in IDP camps front elevation
- Latrine in IDP camps section view
- Latrine O&M
- Two-tank latrine for flooded areas