Emergency Sanitation Guidelines

Beira, updated on the 11th of April 2019

Objective

The objective of this document is to provide technical guidance to partners implementing sanitation emergency programs and interventions **in settlements**. This document has been prepared by the Sanitation Technical Working Group, under the WASH cluster Beira.

1. General standards

Latrines	
1.	Max 50 people per **functional** latrine
2.	Distance of latrines minimum 30 m from any water source
3.	Distance of latrines maximum 50 m from shelters
4.	Distance of latrines more than 6 m from shelters
5.	All latrines have a way of locking form the inside
6.	1:3 male/female latrine ratio
7.	Latrines are physically separated and demarcated
8.	Latrines in health clinics (1 latrine per 20 beds or 50 outpatients)
9.	Provision of accessible toilets based on population of disabled users
10.	The WASH focal agency is responsible for organizing regular desludging (if needed) and decommissioning (when latrine is no longer used). This responsibility can be shared with partners but must be defined
11.	The partner which constructs a latrine is responsible for organizing regular desludging (if needed) and decommissioning (when latrine is no longer used)
Handwashing facility	
12.	All latrines have a handwashing facility
Bathing unit	
13.	100 persons per bathing unit
14.	1:3 male/female bathing unit ratio
15.	Bathing units are physically separated and demarcated when household latrines are not possible
Sanitation Committees	
16.	All latrines are covered by Sanitation/WASH committees, who are responsible for cleaning and maintenance
17.	Sanitation/WASH committees are supplied with latrine cleaning kits
18.	Ratio of male/female WASH committee members equal to latrines (1:3 male/female ration)
Solid Waste	
19.	WASH focal points are responsible for collection and safe disposal of solid waste

Note: While it is not included as a standard for the emergency WASH sector, it is advised that lighting be provided by camp management structures to protect users and encourage use of latrines in camps at night.

2. Sanitation 4W indicators and activities

Sub-sector	Indicator	Activity	Unit
Sanitation	# people with access to appropriate sanitation	3.1 - Installation and management of latrines	# of latrines
		3.2 - Solid waste management	# of waste collection points
		3.3 - Distribution of self-construction latrine kits and garbage pits	# of kits
		3.4 - Installation and management of bathing facilities	# of bathing facilities

3. Latrines

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11.	The partner which constructs a latrine is responsible for organizing regular desludging (if needed) and decommissioning (when latrine is no longer used)

Latrine designs

The designs in this chapter are meant to provide guidance to partners who are interested in constructing latrines. Partners are free to implement other latrine designs in consultation with WASH cluster lead, if other designs prove more feasible in their specific context. When implementing desludgeable latrines, it is advised to maximize the storage volume to alleviate the desludging demand.

Most affected areas have a high groundwater table. The approach of the WASH cluster is to construct regular latrines where possible, and to implement desludgeable latrines only when this is required due to the high groundwater tables. The reasoning behind this is to minimize the demand for desludging, transport and treatment of the faecal sludge.

Partners are advised to assess the groundwater level at the specific location, prior to planning and implementation.

This guideline advices on latrine designs for 2 scenarios:

1. Normal groundwater conditions (groundwater level > 2,5 m below surface)
2. High groundwater (groundwater level <2,5 m below surface)

For each groundwater situation, both an emergency design and an improved emergency design is proposed. A very short description is given for each design, and the actual design, pictures and (for most designs) a Bill of Quantities (BoQs) can be found in the attachment.

	Regular latrines	**Desludgeable latrines**
	Normal groundwater conditions (> 2,5 m below surface)	Extreme high groundwater (< 1 m below surface
Emergency designs	**Design 1.** Emergency unlined pit latrine (Oxfam)	**Design 3**. Emergency desludgeable pit latrine (BRC) **Design 4.** Emergency raised desludgeable pit latrine
Improved emergency designs	**Design 2**. Improved unlined pit latrine (WASH cluster Mozambique Strategy 2017)	**Design 5**. Containerized desludgeable latrine

- **Design 1. Emergency unlined pit latrine**

General emergency unlined pit latrine design produced by Oxfam, can be found in Annex 1.

- **Design 2. Improved unlined pit latrine**

General improved pit latrine, design derived from the Emergency Technical Guidance, WASH cluster Mozambique, can be found in Annex 2.

- **Design 3. Emergency desludgeable lined pit latrine**

Emergency lined pit latrine design feasible for areas with a high groundwater table in and around Beira as developed by the British Red Cross. The design is based on the context of high water tables (i.e. need for lining), the optimization of the sludge storage volume (i.e. to minimize the need for desludging) and the local market. The flexible tarpaulin liner allows for groundwater movement, without having the issue that the lining material is pushed upwards. This design should be extended with a plastic sheet connected to the roof of the superstructure, which can be used to close/lock the latrine from the inside. The design can be found in Annex 3.

- **Design 4. Emergency desludgeable raised lined pit latrine**

Emergency lined pit latrine design feasible for areas with a high groundwater table in and around Beira, as developed by British Red Cross. This design is equal to design 3, but extended with a raised structure, based on sandbags filled with cement. This design is thus adopted to extreme high groundwater situations (<0.3 m). A large tarpaulin sheet is used as lining material and timber is used to stabilize the pit. The flexible tarpaulin liner allows for groundwater movement, without having the issue that the lining material is pushed upwards. This design should be extended with a plastic sheet connected to the roof of the superstructure, which can be used to close/lock the latrine from the inside. The design can be found in Annex 4.

- **Design 5. Containerized desludgeable latrine**

Improved containerized latrine design feasible for areas with a high groundwater level, as developed by MSF OCA. This design is based on the local market. A 500 L vertical water tank is buried, stabilized with sand and connected to one latrine slab. This design should be extended with a plastic sheet connected to the roof of the superstructure, which can be used to close/lock the latrine from the inside. Pictures of the latrine can be found in Annex 4.

Inclusive latrines

All latrines should have a way of locking from the inside. The male/female ratio should be 1:3 and latrines need to be physically separated and demarcated. Focal WASH points are advised to plan for Menstrual Hygiene Management (MHM), by either providing space for washing cloth or for disposing disposable pads.

Assessment of need for accessible latrines

The WASH focal agency is required to assess the size of the disabled population and to consult the disabled and elderly directly to identify the needs. According to the needs, emergency latrines can be upgraded with rope handles, poles or raised seats to make latrines inclusive and accessible.

Faecal Sludge Management

The WASH focal agency is responsible for organizing the regular desludging of desludgeable latrines. Full latrines can either be desludged by the Serviços Autónomos de Saneamento da Beira (SASB) or by a private desludging company. The following private desludging companies are licensed by SASB to discharge the faecal matter to the Munhava Wastewater Treatment Plant, which treats and disposes of the faecal matter safely. More private operators are active in Beira, but the SASB and the three private operators are trained in the safe handling of sludge and the use of Personal Protective Equipment (PPE).

Municipal faecal sludge collection	**Contact**
Serviços Autónomos de Saneamento da Beira Departamento (SASB) Departamento de Operacao e Manutencao (Eng Chabuca)	84 038 7200
Private operators	
Chaquil Ravate	84 501 9250 / 87 501 9250
Tomo TZM	875018788 / 845056864
Chone	845192590

Latrine decommissioning

Once a transfer station or settlement is closed, the WASH focal agency is responsible for the decommissioning of the emergency latrines. Even if the WASH focal agency did not construct the specific latrines. In the attachment a decommissioning guideline is shown, using lime ($CaOH_2$, cal apagado)

4. Handwashing facilities

General standard

12.	All latrines have a handwashing facility

Each latrine/latrine block must be implemented with a handwashing facility.

Handwashing facilities need to be supplied with soap. Ideally, a minimum water storage/jerrycan of 4.5 L is available, to reduce the operational filling demand. Jerrycans/buckets for handwashing facilities need to be protected against theft.

Figure 1 Handwashing facility

5. Bathing units

General standards

13.	100 persons per bathing unit
14.	1:3 male/female bathing unit ratio
15.	Bathing units are physically separated and demarcated when household latrines are not possible

Designs

It is essential that a bathing unit provides privacy for safe bathing. When possible, the bathing units should be separated from the latrines to avoid confusion with latrines and limit odors in the bathing units due to proximity to the latrines. Showers can be basic, with a stick of wood and plastic sheeting and any kind of platform. However, an improved latrine design is presented in the attachment.

6. Sanitation/WASH committees in camps and settlements

16.	All camps are covered by Sanitation/WASH committees, who are responsible for cleaning and maintenance of latrines
17.	Sanitation/WASH committees are supplied with latrine cleaning kits
18.	Ratio of male/female WASH committee members equal to latrines (1:3 male/female ration)

Sanitation committees are camp members organized and supplied to maintain and clean sanitation facilities. The committees are also responsible for ensuring water availability at water points. This group can be equal to the WASH committee (responsible for water points). The implementing partner is responsible for setting up, training and guiding the sanitation committees. The committee needs to be supplied by the implementing agency with a basic cleaning and maintenance kit, existing out of (for example):

Content of Sanitation Committee cleaning kit	
Description	**Unit price**
Soap	MZN 40
Disinfectant for latrine cleaning (5L /latrine)	MZN 1,600
Buckets	MZN 150
Brushes	MZN 200
Gloves (2X)	MZN 100
Gumboots	MZN 1,000
Plastic aprons	MZN 500

7. Solid Waste management

19.	WASH focal points are responsible for collection and safe disposal of solid waste

For each camp, the WASH focal point is responsible for solid waste management. Communal baskets of 50 L are required, and household level buckets are advised (with holes in the bottom to prevent usage for other purposes. The waste needs to be regularly collected.

WASH focal points need to communicate with the municipality or 3R (local waste collection, recycle and recovery agency) to arrange waste collection

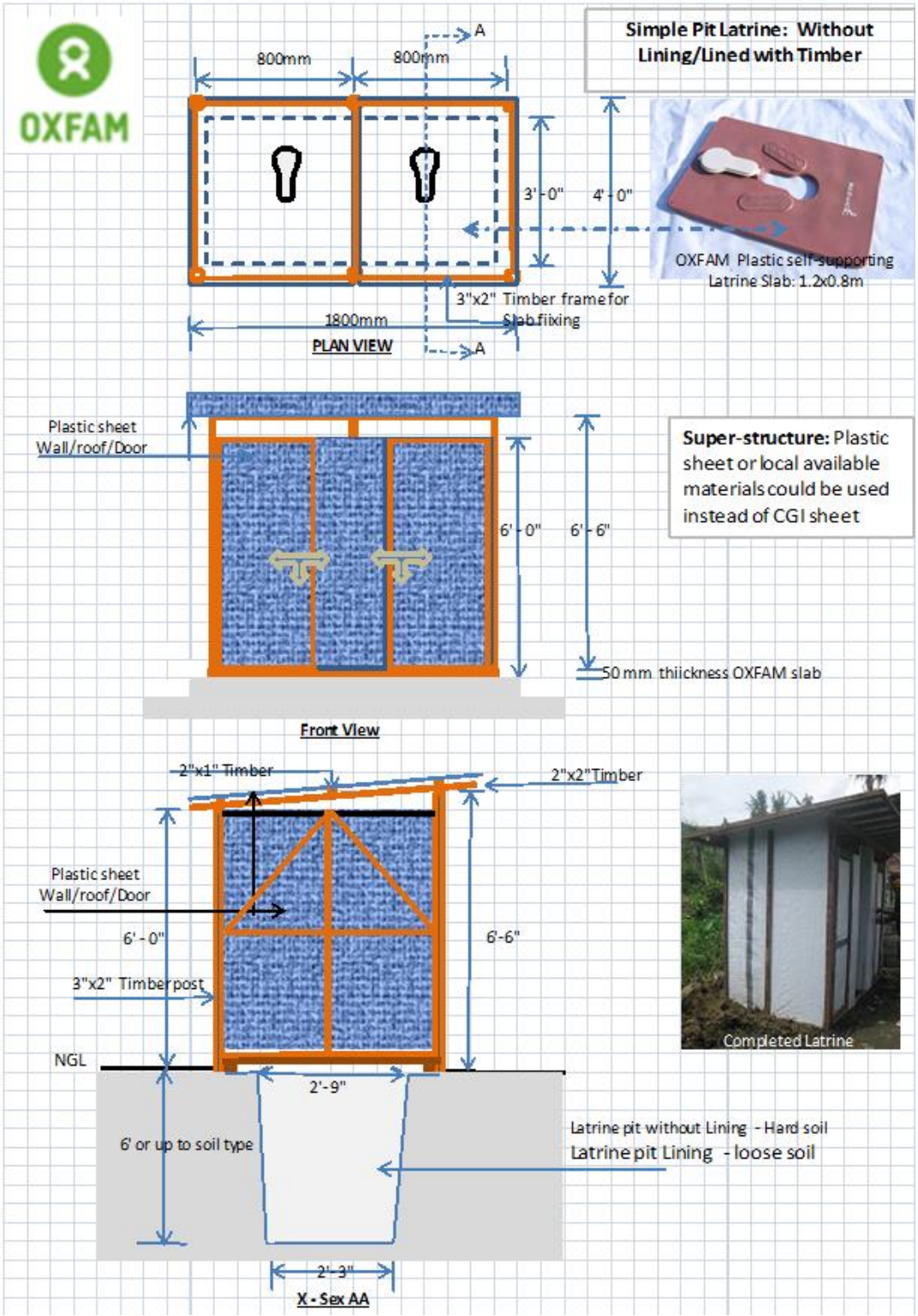
Figure 2 waste collection bucket

Contacts for solid waste collection				
AMOR – Associacao Mocambicana de Reciclagem	Director	Stephane Temperman	864617764	stephane@3R-mozambique.com
Município de Beira	City councellor/ Feriador de salubridade	Dr. Domingos	845968791	

LIST OF ANNEXES

Annex 1A. Design 1. Emergency unlined pit latrine (Oxfam)

Normal groundwater conditions



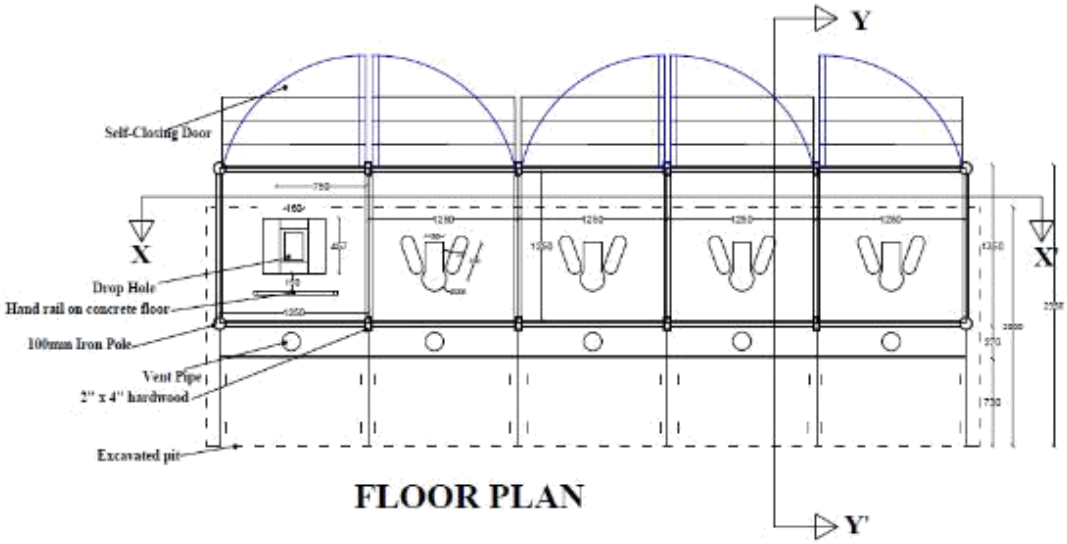
Annex 1B. Design 1. Emergency unlined pit latrine (Oxfam)

Normal groundwater conditions

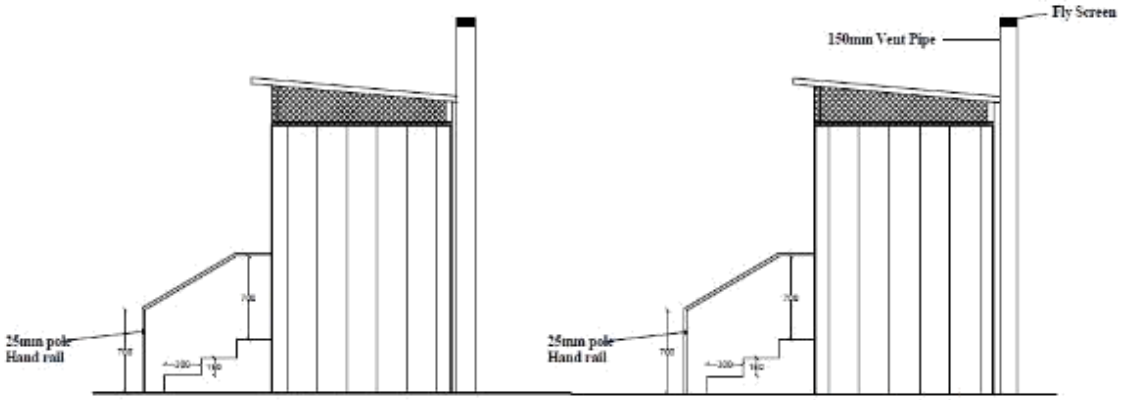
Item descriptions	Unit	Total Unit	Costs in US Dollar (estimate)	
			Unit cost	Total cost
Pit Digging	m3	2.4	150	8.6
Coco Lumber 1"x2"x8'	pcs	22	20	10.5
Coco Lumber 2"x2"x10'	pcs	16	50	19
Coco Lumber 2"x3"x8'	pcs	6	60	8.6
CWN 2"	kg	2	60	2.9
CWN 3"	kg	2	60	2.9
CWN 4"	kg	2	60	2.9
Barrel Bolt (Ordinary)	pcs	2	30	1.4
Hinges 3"x3"	pair	4	40	3.8
Door Handle 5"	pcs	2	30	1.4
PVC Pipe 2" dia.(Sanitary Pipe)	pcs	1	250	6
Latrine Slab w/ P-Trap	set	2	2,030	96.7
Tarpaulin 4x6	shits	2	644	30.7
Labour cost for construction				
Skilled	Man-days	2	200	9.5
Un- skilled	Man-days	4	150	14.3
Total Cost Per Country (US$): 2 cubicles				**219**

Annex 2A. Design 2. Improved unlined pit latrine (Emergency Technical Guidance, WASH cluster Mozambique)

Normal ground water conditions

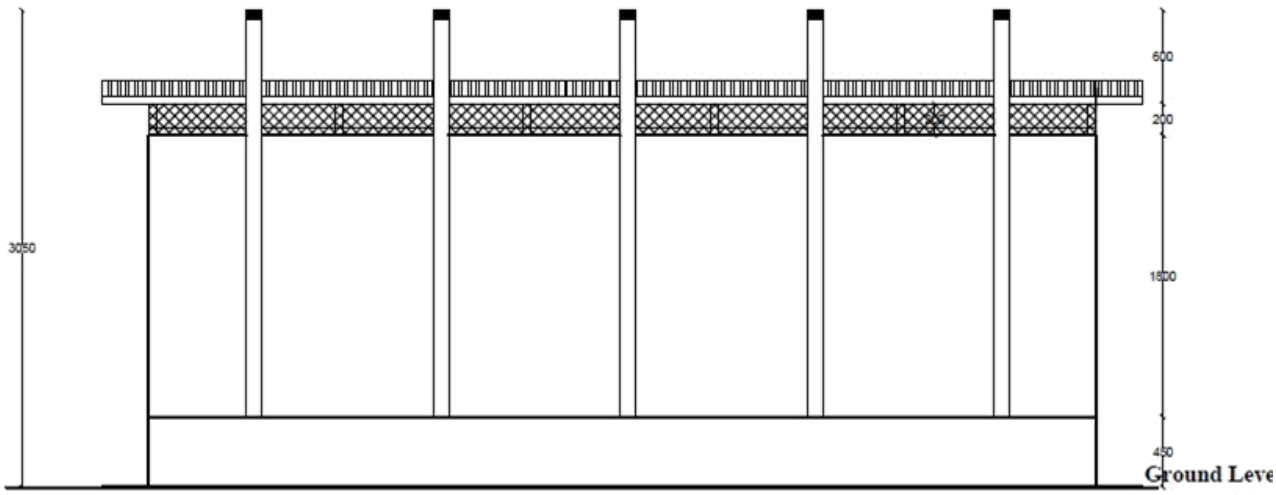


FLOOR PLAN

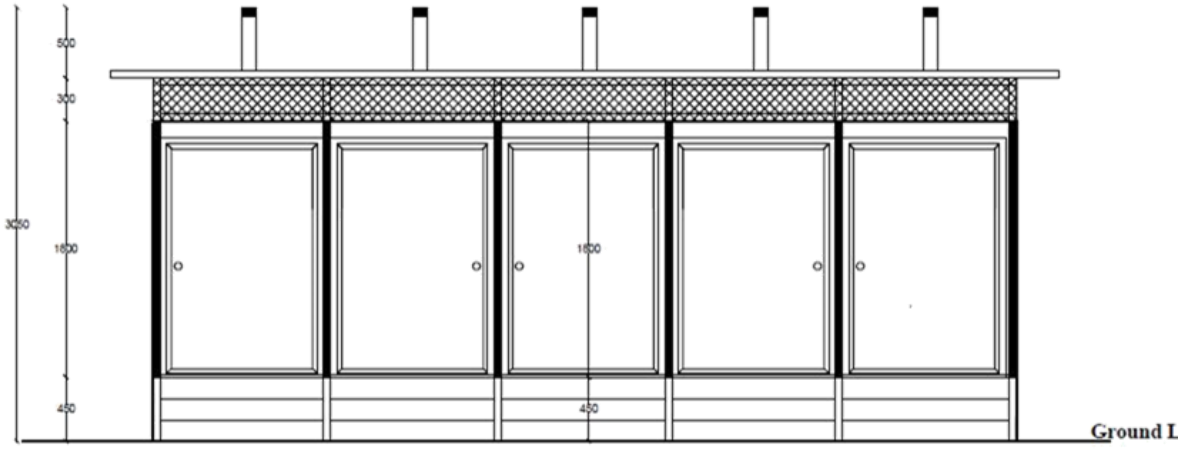


Right View

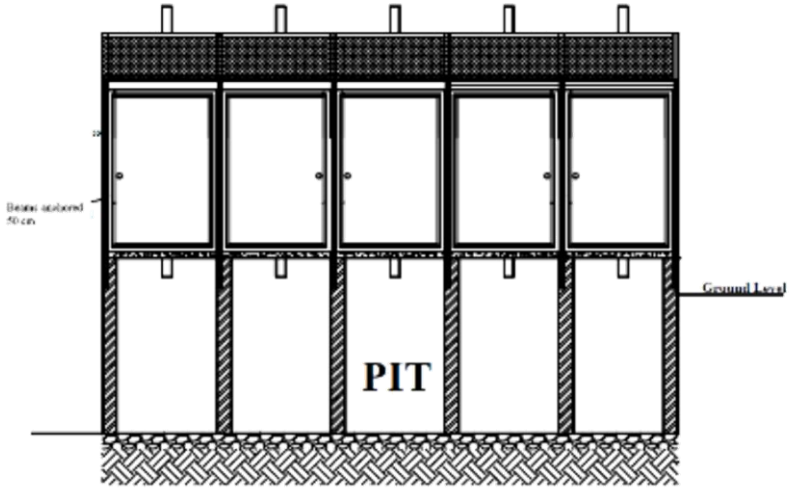
Left View



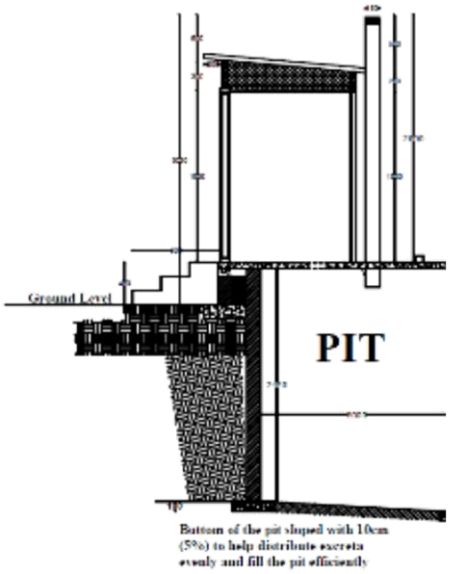
Back View



Front View

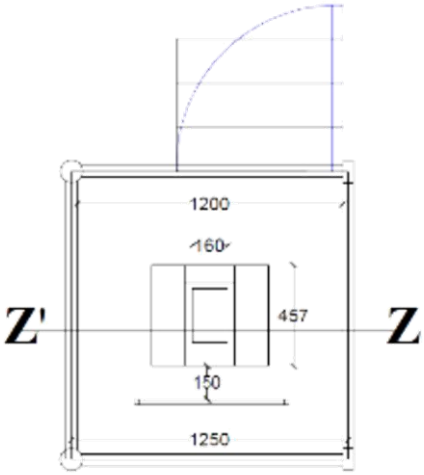


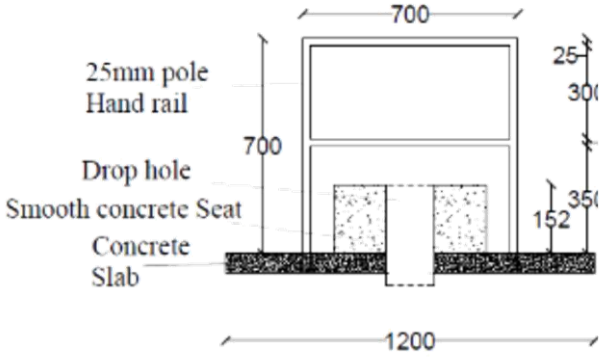
Section X-X'



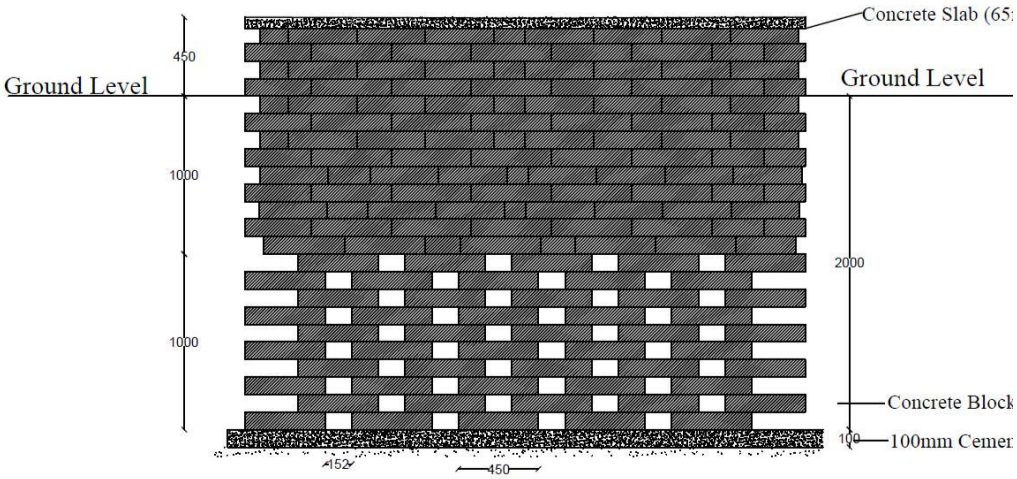
Section Y-Y'

Detail of Disabled Compartment





Section Z-Z'



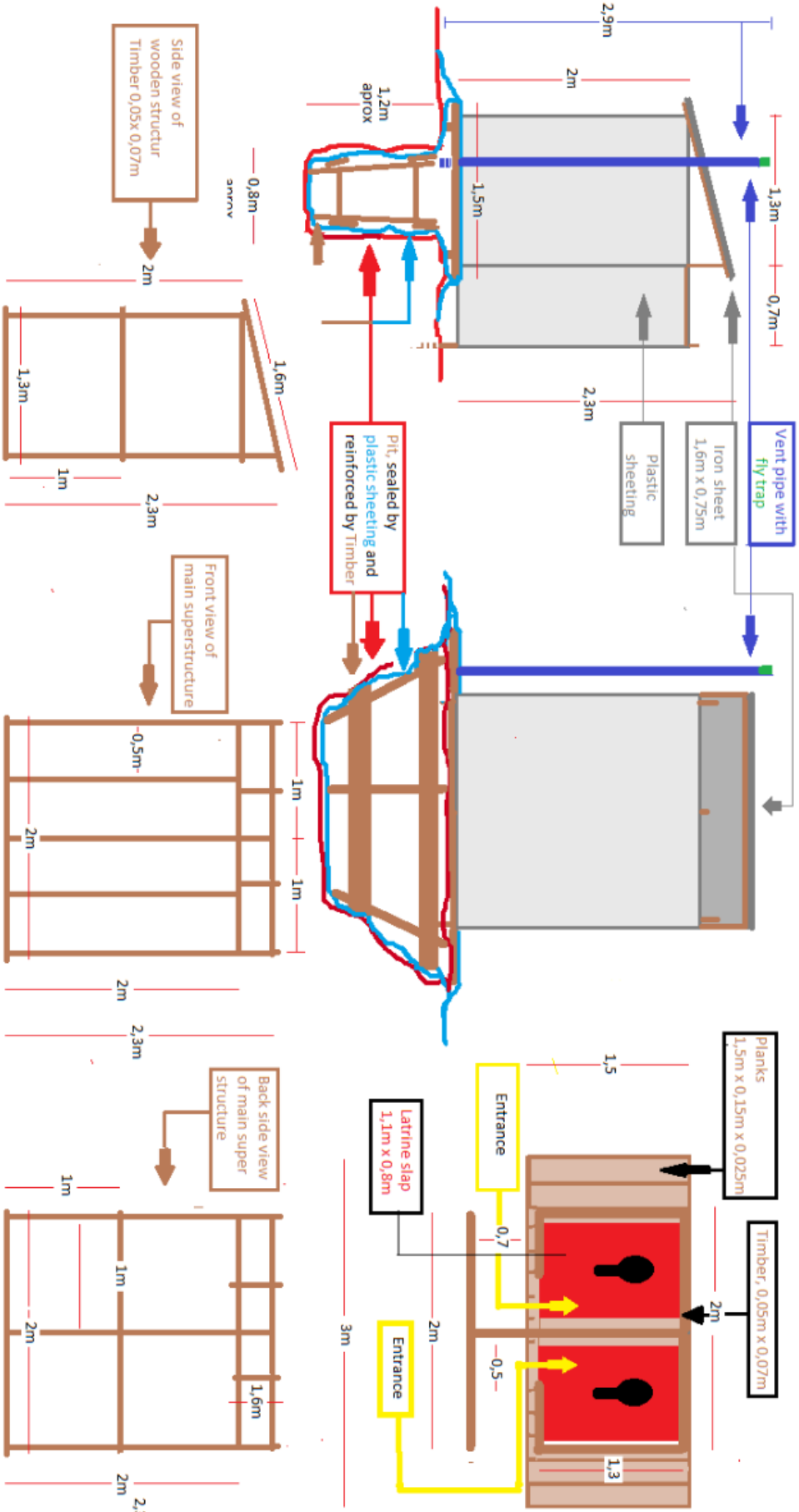
Pit Lining Detail

Annex 2B. Design 2. Improved unlined pit latrine (WASH cluster Mozambique Strategy 2017

SN	DESCRIPTION	UNIT	QUANTTY	TOTAL (USD)
1	**Excavation and earthworks**			
A	Clearing of site	M^2	40	$ 25.95
B	Excavate latrine pit to a depth of 2.5 m	M^3	42	$ 136.22
C	Excavate trench to receive concrete in foundation depth	M3	2	$ 7.57
D	Backfill and ram foundation spread and remove surplus excavated materials	M3	25	$ 54.05
E	Provide anti termite treatment to surfaces of excavation (where applicable)	M2	42	$ 45.41
	Total of section 2 carried to summary			$ 377.30
2	**Sub structure**			
	Concrete works			
Plain	in situ concrete (concrete mix 1:2:4 – 20mm aggregate) in:			
A	Foundation (footing)	M3	3.9	$ 505.95
B	Floor (65 mm) thick as in the drawings	M3	0.2	$ 25.95
	Reinforced concrete (1:2:4- 20mm aggregate) in:			
C	Precast concrete pit cover slabs (1250 x 1250 x 65 mm) (5 nos)	M^3	0.5	$ 68.62
D	Precast concrete vent pipe slabs (1250 x 250 x 65 mm) (5 nos)	M3	0.1	$ 13.72
E	Precast concrete service slabs (1250 x 500 x 65 mm) (5 nos)	M3	0.2	$ 27.45
	Sawn form work to:			

F	Sides of slab	M	18	$ 48.65
G	Soffits of concrete slab	M	8	$ 43.24
	Hollow sandcrete block work bedded and jointed in cement and mortar (mix sand 1:6)			
H	225mm wall for pit lining	M2	61	$ 956.22
I	100 mm PVC vent pipes	Piece	5	$ 40.54
	Total of section 3 carried to summary			$ 1,730.34
3	**Superstructure (zinc)**			
	Zinc roofing sheet laid at 150 mm and lap side and 2 corrugation laps nailed to:			
A	Walls	M2	82	$ 376.76
B	Roof	M^2	9.1	$ 41.81
C	Doors	Piece	5	$ 22.97
	Carpentry and joinery			
	Treated sawn hardwood			
D	75mm x 50mm purlin	M	152	$ 98.59
E	75mm x 50mm rafter		25	$ 16.22
	Handrails and support rails			
F	Steel pole, 25 mm bar	Bar	1	$ 16.22
	Total of section 4 carried to summary			$ 572.57
	SUMMARY			USD
1	Section 2 Excavation			$ 377.30
2	Section 3 Substructure			$ 1,730.34
3	Section 4 Superstructure			$ 572.57
	Total for 1 block of 5 compartments emergency latrine			**$ 1680,21**

Annex 3A. Design 3. Emergency desludgeable lined pit latrine (BRC)



Annex 3B. Design 3. Emergency Raised latrine with open bottom (BRC)

Cost of each latrine considering the design of "double cabin" latrine with the pit 'sealed' and reinforced with plastic sheeting and timber. Walls of super structure made by timber, walls by reinforced plastic sheeting and roofing by iron sheet. PVC ventilation pipe for each double cabin, with mosquito net covering the upper opening of it (acts as ventilation and fly trap).

Timber: 80,650 (approx. 8,500 per Latrine)
Iron sheet: 27,000 (approx. 1,350 p/L WITH PLASTIC SHEET WALLS, IRON SH. ROOF)
Wire + Nails: 6,950 (approx. 600 p/L)
Labor: 5,000 (approx. 500 p/L). Calculation based on 5 labor + 1 team responsible
PVC pipe (ventilation) : 1,050 (approx. 175 p/L)
Digger rental: 12,000 (approx. 1,200 p/L).

Total per latrine: 12,325 MTN

Transport costs: 2,500 per trip but more practical to rent per day (9,000Mt) and keep materials loaded during night)

Timber sizes and quantities:
(All timber is 5cm x 7cm strong)
2m=12 pcs
1,3m= 7pcs
2,3m= 6pcs
3m= 5pcs
1,6m=4pcs
1m= 8pcs
Planks :24 pcs of 1,5m x 0,15m x 0,025m

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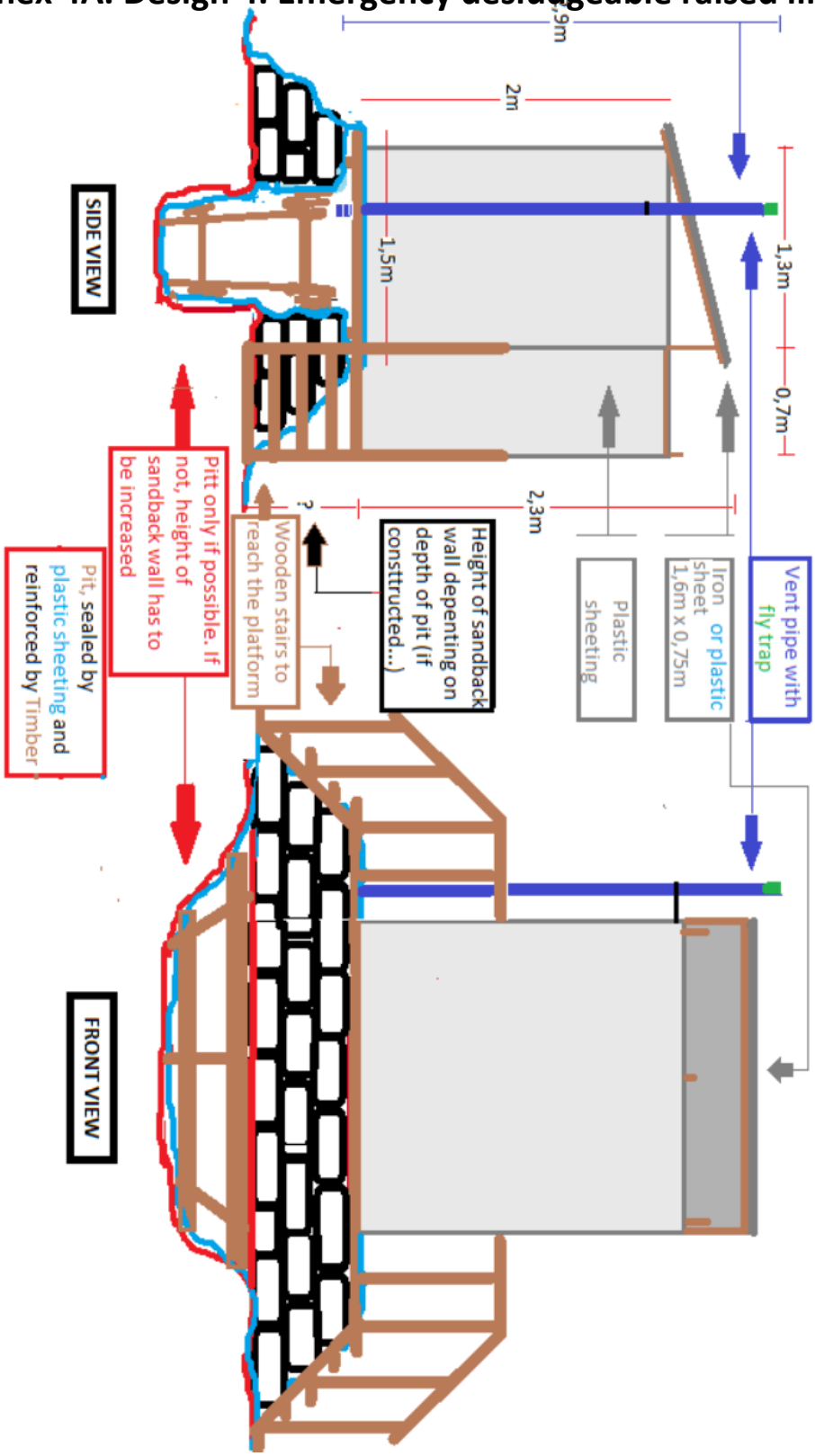
Annex 4A. Design 4. Emergency desludgeable raised lined pit latrine



Annex 5. Design 5. Containerized desludgeable latrine (MSF OCA)

Bill of Quantities

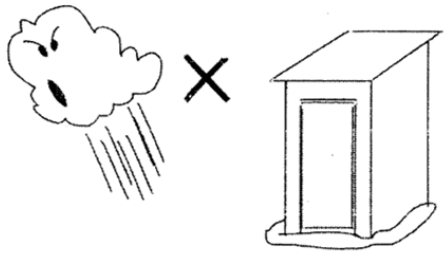
- 1 - 500 litre poly tank. Horizontal configuration is preferable due to reduced height.
- 30 - Sand bags. Not always necessary but convenient to elevate the latrine slab.
- 1 - 120 x 80 cm poly latrine slab or equivalent
- 6 - 2 cm x 2 cm x 2 m timbers for slab frame and superstructure support
- 8 x 4 m plastic sheeting
- 1 kg - 3 cm nails

  = 250 USD

Design

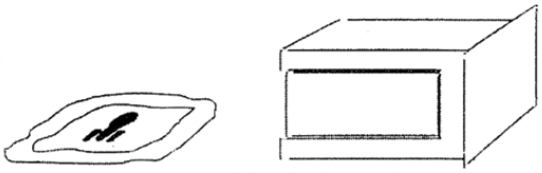
Annex 6 – Guidelines on simple latrine decommissioning using lime ($CaOH_2$)

1. Carry out latrine closure during 'dry' periods.



This allows the septscdacdage to dry out, and reduces risk of storm water problems.

2. Remove all structures from above pits.



Take care of potential health hazards;

- Wear protective clothing.
- set aside specific areas for disinfecting slabs and superstructures. (away from water sources)

3. Dig an 'overflow' trench from top of pit or tank to absorb displaced fluids.
This should be large enough to allow a large quantity of material to be displaced from the pit.
Bacteria and other soil fauna will quickly breakdown and absorb nutrients and contaminants.

line drain / leach field
- uses more space but allows dispersement of materials through a greater area of ground.

curtain drain - trench dug around the latrine
- use where space is confined.
- access to the latrine can be difficult

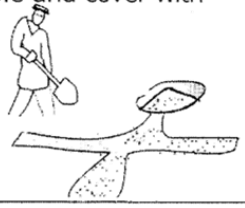
4. Remove, smash or crack the linings that are accessible

5.Cover the pit contents with

Lime and then fill the pit with rubble and organic matter until the pit is nearly full

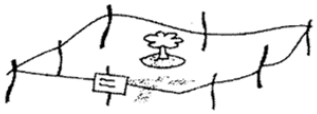
Add Allow displaced fluid to drain into the surrounding soil

6) Backfill trench with soil and rubble and cover with Lime

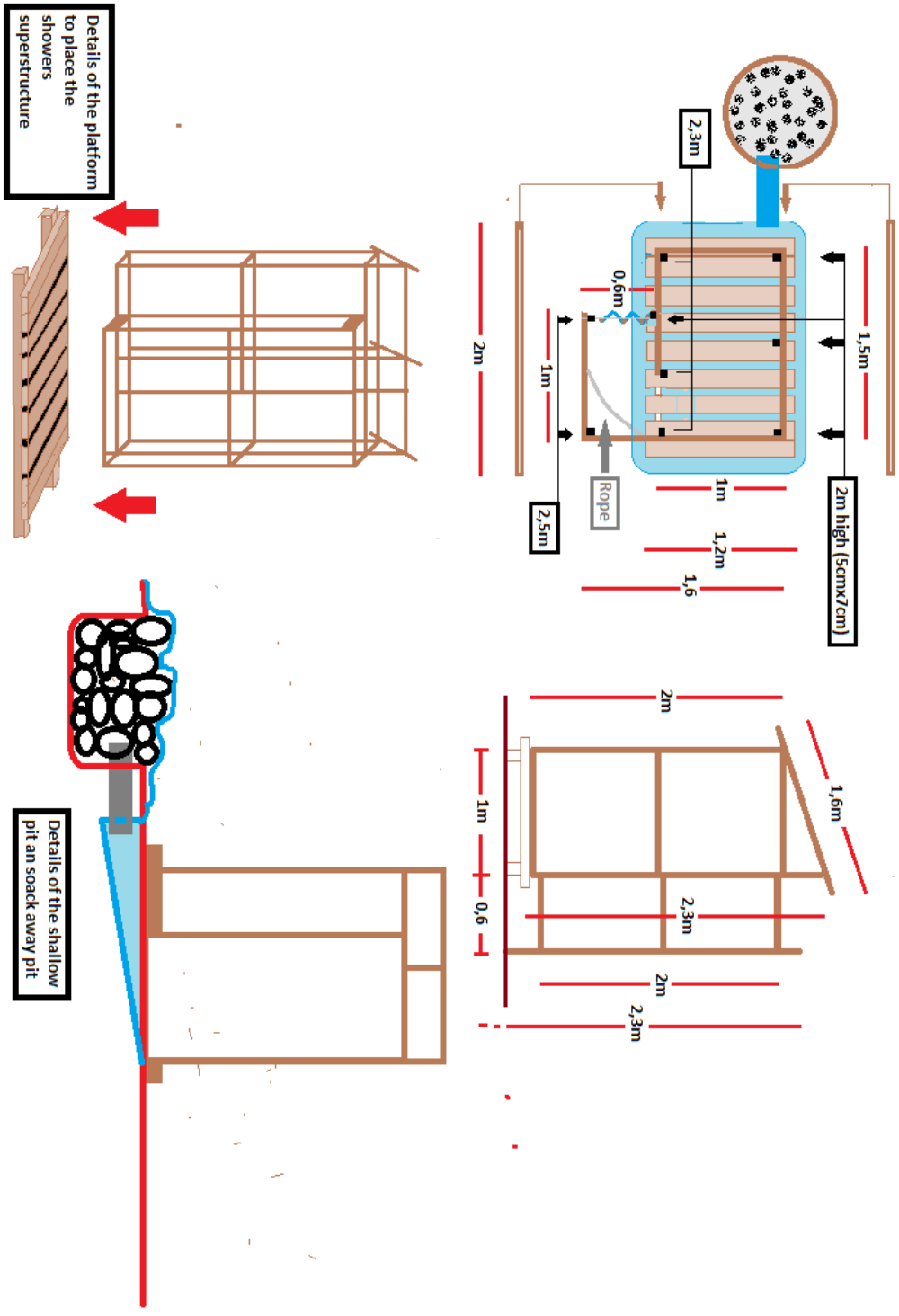


7. 'Cap' the pit with a large mound of soil and rubble to allow for further settling of content

HEALTH AND SAFETY
Fence off the area to prevent it from being disturbed.
Place signs indicating a hazard around the site.
Ensure that NO RISKS ARE TAKEN by the beneficiaries nor by the personel in charge of dismantling.



Annex 7 – Design improved bathing unit



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Annex 7 – Design improved