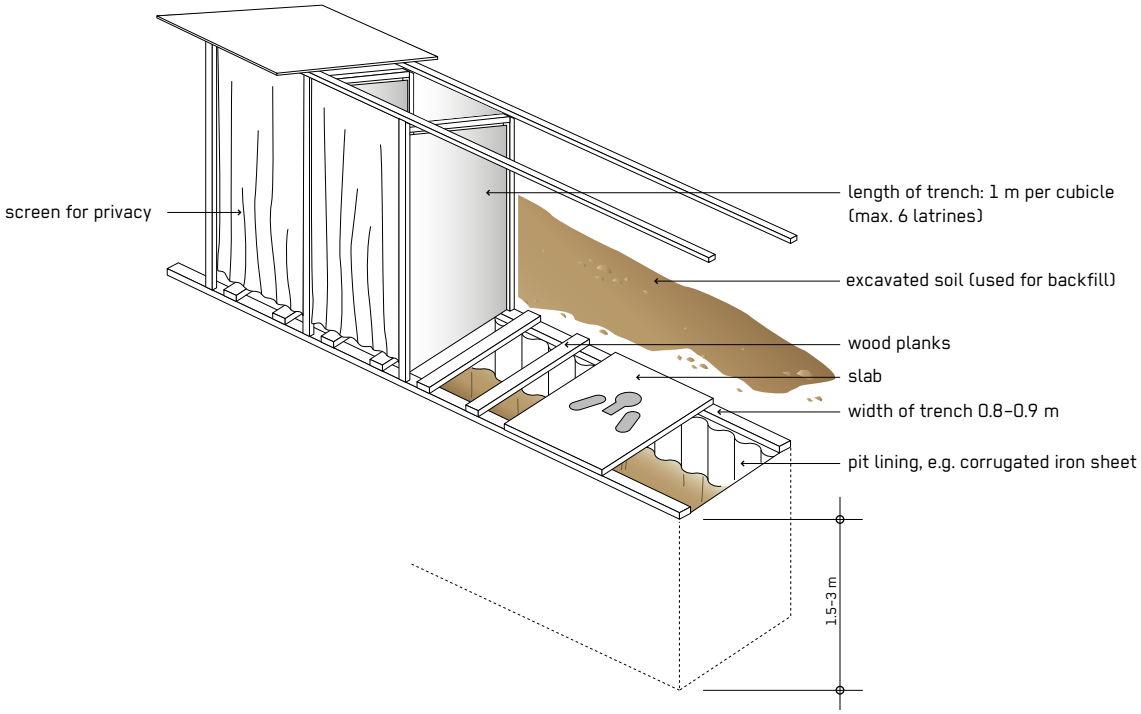
Deep Trench Latrine

Phase of Emergency	Application Level / Scale	Management Level	Objectives / Key Features
** Acute Response * Stabilisation Recovery	Household ** Neighbourhood City	Household * Shared ** Public	Excreta containment, Minimising immediate public health risk, Fast implementation
Space Required	**Technical Complexity**	**Inputs**	**Outputs**
** Medium	* Low	● Excreta, ● Faeces, ● Blackwater, (● Anal Cleansing Water), (● Dry Cleansing Materials)	● Sludge



A Deep Trench Latrine is a widely-used communal latrine option for emergencies. It can be quickly implemented (within 1–2 days) and consists of several cubicles aligned up above a single trench. A trench lining can prevent the latrine from collapsing and provide support to the superstructure.

As the trench fills, three processes limit the rate of accumulation whilst providing no significant treatment: leaching, degradation and consolidation. The liquid phase (i.e. urine and water) leaches into the soil through the unlined bottom and walls of the pit, while microbial activity degrades part of the organic fraction and stabilises the pit content. As a result, consolidation occurs.

Design Considerations: Trenches should be around 0.8–0.9 m wide with at least the top 0.5 m depth of the pit lined for stability. The depth (usually between 1.5 to 3 m) may vary depending on local soil conditions and required speed of implementation. A maximum trench length of 6 m is recommended, providing for six cubicles. End cubicles can be extended to make them accessible for disabled people or provide washing spaces, for example for women during menstruation. Proper drainage should be provided for around the trench to ensure runoff and prevent flooding. When the trench is complete, slabs are placed over it. Prefabricated self-supporting plastic slabs can increase the speed of construction, if available. Alternatively, wooden planks can be secured across the trench (leaving out every third or fourth plank for defecation) until wooden or concrete slabs can be produced locally. The slabs can be fitted with pedestal toilets where users do not squat. Separate trench latrines for men and women should be considered. The trench lifespan (the time required to fill it to within half a metre of the top) is a function of the trench volume, divided by the number of users and estimated excreta volume generated per person. On average, solids accumulate at a rate of 3–5 L/person/month and

up to 5–7.5 L/person/month if dry cleansing materials are used. Special attention should be paid to the expected groundwater level and the associated risks of groundwater pollution as well as the topography, ground conditions and soil permeability. Poorly permeable soil will increase the rate at which the pit fills.

Materials: If possible, locally available construction materials should be used. The latrine superstructure can be made from local materials, such as bamboo, wood, plastic or metal sheeting (though this often heats up the interior). The trench lining can be made from bricks, timber, sand bags or temporary lining materials such as bamboo poles or matting. Some relief agencies have rapid response kits for slabs and superstructure which can be used where there are few resources locally.

Applicability: Deep Trench Latrines can be a viable solution in the acute phase of an emergency provided that the technology is acceptable to the users, the ground conditions allow digging of deep trenches and there are sufficient tools, materials and human resources available. As no water is needed for operation it is also a viable solution for water-scarce areas. Deep Trench Latrines can be replicated fast and implemented at scale given that enough space is available.

Operation and Maintenance: Deep Trench Latrines are usually built as communal latrine blocks. The general operation and maintenance (O & M) measures therefore include regular cleaning, routine operational tasks such as checking availability of water, hygiene items, soap and dry cleansing materials, providing advice on proper use, conducting minor repairs and monitoring of trench filling level. O & M also includes daily covering of excreta with a 10 cm layer of soil to minimise odour and prevent fly breeding. As trenches are often misused for solid waste disposal, which can complicate later emptying, awareness raising measures **(X.12)** should be a part of installation programmes. Accessibility for desludging vehicles **(C.2)** should be considered. If desludging is not an option the latrines should be decommissioned **(X.6)** when the trench is filled up to 0.5 m below the top of the trench.

Health and Safety: If used and managed well, Deep Trench Latrines can be considered a safe excreta containment technology in the acute response phase. They should be equipped with Handwashing Facilities **(U.7)** and proper handwashing with soap after toilet use needs to be addressed as part of hygiene promotion activities **(X.12)**. Additional illumination at night, security guards for protection and accessibility for all users is required. The trench site should be carefully chosen to avoid areas prone to flooding and drainage ensured as part of construction. As with all pit-based systems, groundwater contamination can be an issue and soil properties such as the permeability of the soil and groundwater level should be properly assessed **(X.3)** to identify the minimum distance to the next water source and limit exposure to microbial contamination. The Sphere minimum standards on excreta management should be consulted for further guidance. Emptying the trench **(C.1, C.2)** should be carried out in such a way as to minimise the risk of disease transmission including personal protective equipment and hygiene promotion activities **(X.12)**.

Costs: Building Deep Trench Latrines is relatively inexpensive. Costs vary depending on availability and costs of local materials or use of prefabricated slabs and cubicles. Cost calculations also need to reflect O & M requirements and follow-up costs such as regular desludging, transport, treatment and disposal/reuse of accumulating sludge.

Social Considerations: If time allows, the design of Deep Trench Latrines should be discussed with the community before installation. It should reflect local user preferences (sitter vs. squatter, anal cleansing practices, direction, positioning, screens etc.) and should account for the accessibility and safety of all users, including men, women, children, elderly and disabled people **(X.10)**. As Deep Trench Latrines are usually communal latrines, O & M will require particular attention. Roles and responsibilities for O & M need to be agreed upon early on and closely linked to hygiene promotion activities **(X.12)**. As trenches are often misused for solid waste disposal, which might negatively affect later emptying of the trench, special awareness raising measures should be considered.

Strengths and Weaknesses:

- ⊕ Inexpensive and quick to construct
- ⊕ No water needed for operation
- ⊕ Easily understood

- ⊖ Unsuitable for areas with high water-table, unstable soil, rocky ground or prone to flooding
- ⊖ Often odour and fly problems and issues with other vectors
- ⊖ Needs appropriate faecal sludge management concept
- ⊖ Groundwater contamination might be an issue

→ **References and further reading material for this technology can be found on page 190**