shelter associates

One Home One Toilet

DELIVERING TOILETS

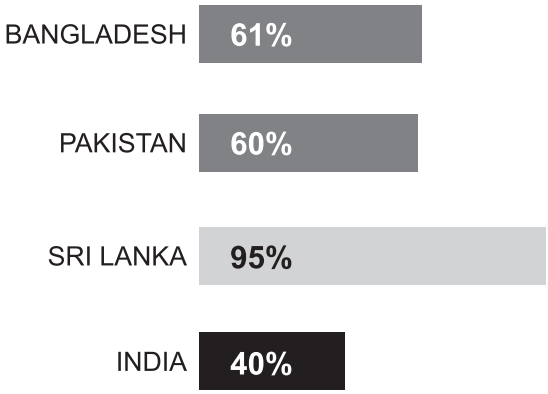
A Toolkit for delivering Sanitation in Slums

3/3

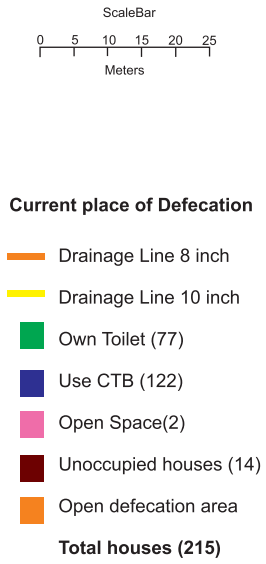
Contents

Foreword

According to the World Bank only 40% of Indians have access to improved sanitation and as a result India performs worse than Bangladesh (61%), Pakistan (60%), and Sri Lanka (95%). Lack of access to improved sanitation, meaning a facility that hygienically separates human excreta from human contact, has a detrimental impact on the health, education, financial security, and safety of 600 million Indian citizens, the majority of which reside in informal settlements.



Shelter Associates (SA) was established with the vision of an India where every citizen has access to the infrastructure essential for human survival and dignity and since it's founding SA has designed and implemented many slum rehabilitation projects and influenced national policy. Historically SA has been involved with Community Toilet Block (CTB) schemes but experiences with these projects led us to conclude that CTBs are ineffective endeavours which are high on capital expenditure and commit Urban Local Bodies (ULB) to expensive maintenance regimes. CTB's are usually a default option adopted by ULB's due to the lack of accurate data which would enable a targeted approach; a problem that our OHOT methodology addresses with the collection, verification, organisation, and interrogation of data. The data is presented as overlays on remote sensing images, such as Google Earth ® Maps, to enable a detailed understanding of the surveyed settlement and resident community.



As an organisation SA have moved away from CTB projects as it has been our observation that wherever families have been provided with their own household toilet, they have not only maintained them but also upgraded them over a period of time. This has led to the conviction that whenever possible individual sanitation is the most sustainable and scalable option to address the lack of access to improved sanitation that is experienced across the country. The OHOT model links well with the Government of India's Swachh Bharat Mission (SBM) and the National Urban Sanitation Policy (NUSP).

This document represents the culmination of years of practical experience in the slum rehabilitation sector and is intended to serve as a guide for facilitators, sponsors, and governments to steer the design and implementation of sanitation projects within informal settlements. This toolkit can be used in full or in part, facilitators can adopt the whole OHOT model or use parts of this document to strengthen their existing approach so that collectively we can elevate India to the status of 'Open Defecation Free' (ODF).

Last but not the least, I would like to thank DASRA Foundation for all their support and my colleagues Ross, Resham, Smita , Dhanashree and Shabana for painstakingly going through the innumerable drafts and refining the tool kit that I take great pleasure in presenting to all our readers.

Pratima Joshi
Founder & Executive Director
Shelter Associates

Introduction

This toolkit is compiled using SA's experiences of facilitating a range of sanitation solutions in informal settlements of urban Maharashtra since the year 2000. SA's 'One Home, One Toilet' (OHOT) model is a result of experimentation and continuous refinement over a period of time and developed from the observation that the provision of sanitation on a household basis is more impactful and sustainable as compared to the provision of Community Sanitation facilities.

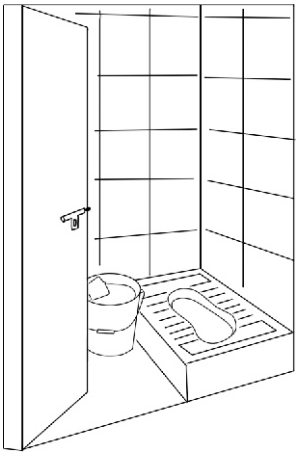
SA's OHOT model has also proven to be a holistic and a cost effective option for achieving 'Open Defecation Free' (ODF) status in informal settlements. Due to the universal nature of the objectives of each work stage, the OHOT model, in addition to being cost effective is replicable and scaleable, and therefore represents a solution to India's sanitation crisis that is both appropriate and feasible.

The intention of this document is to explain the OHOT model in detail so that it can guide any agent/agency involved in, or tasked with, the delivery of improved sanitation in informal communities. When emulated the toolkit will enable:

1. Implementers (NGOs, consultants, etc.) to design new projects which facilitate long lasting impactful change

2. Implementers/funders to develop existing projects into more robust propositions with regard to impact and sustainability

3. Policy makers/policy advisors to make sensitive and informed decisions when drafting slum sanitation policies, city sanitation plans (CSP), etc.



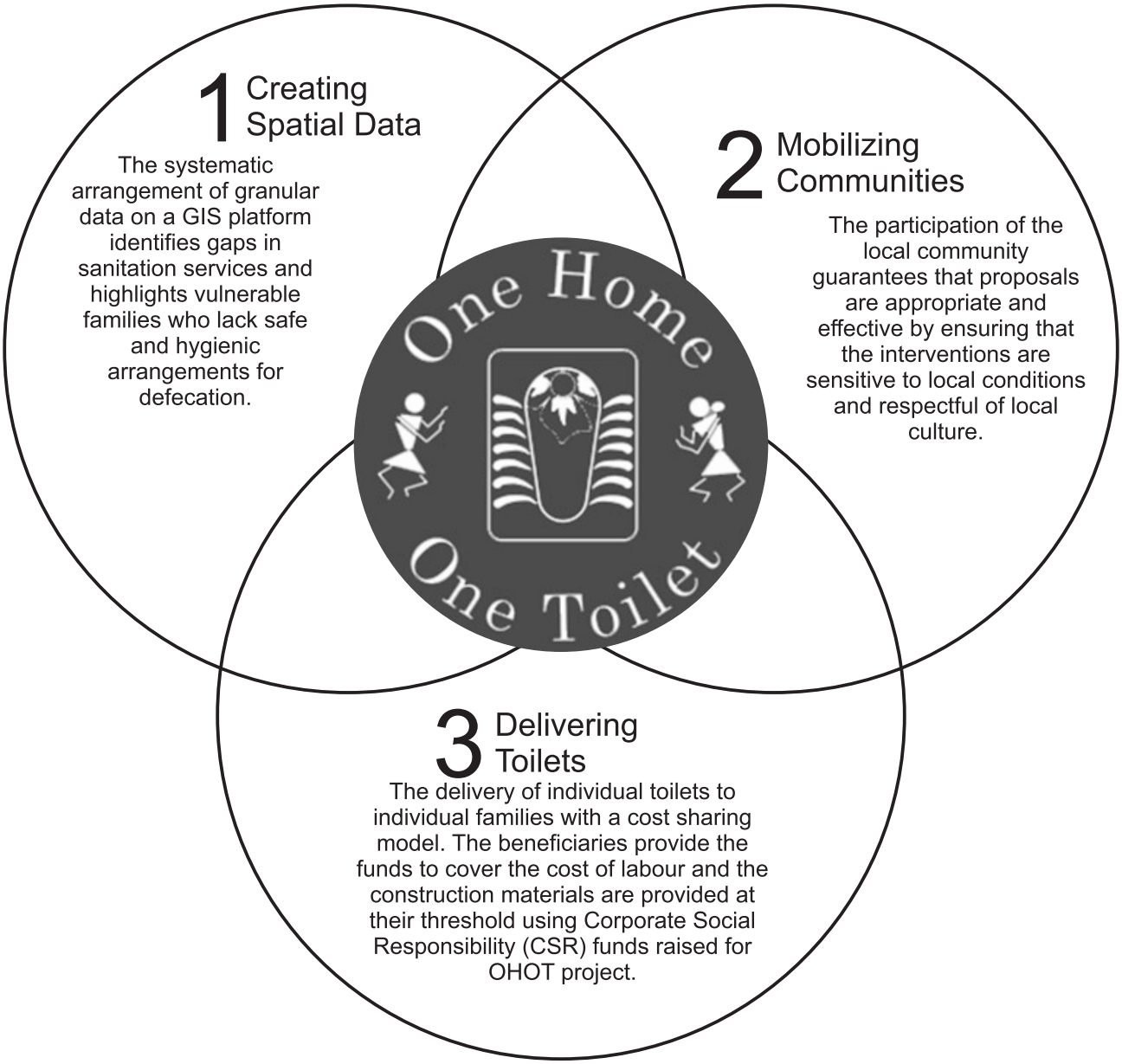
4. City administrators to make sensitive and informed decisions when executing slum sanitation policy

5. Potential beneficiaries (residents of informal settlements) to lobby their Urban Local Body (ULB) for access to improved sanitation

The toolkit can be used in full or in part; users can carry out any work stage as an individual exercise or repeat all work stages of the OHOT model. It is recommended that the user understands the full model, especially the objectives and prerequisites of all work stages prior to omitting a work stage. Each work stage is explained in detail and includes a description of the objectives and the prerequisites so that the user can be sure that a stage or stages can be omitted i.e. If an accurate understanding of the ground reality is already present then the users, if they trust the data available, could opt to omit stage 1 (data collection and GIS) and start their involvement from stage 2 (community mobilization). Users can also adopt the model to suit their local conditions and local project context, so long as the alterations do not negate the primary objectives of the work stages.

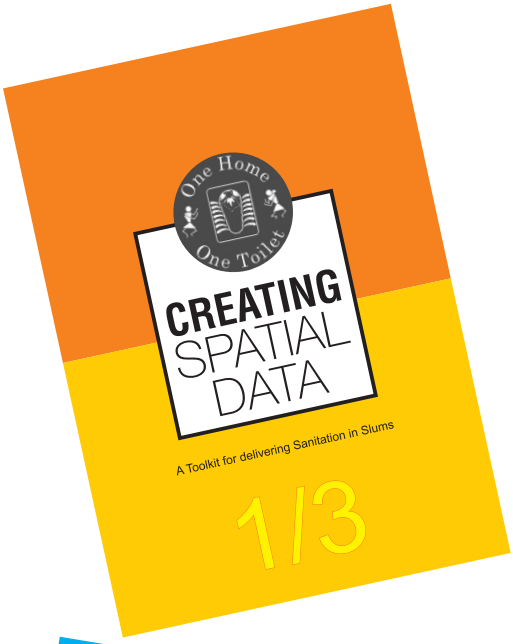
This toolkit is arranged sequentially to describe the progression of the model. The OHOT model has three distinct work stages which flow as a series; the results of a stage are the prerequisites for the next which is why care must be taken if the users of the toolkit decide to skip a stage. In this toolkit each stage is detailed in an individual booklet.

DATA DRIVEN, COMMUNITY CENTRIC SANITATION MODEL



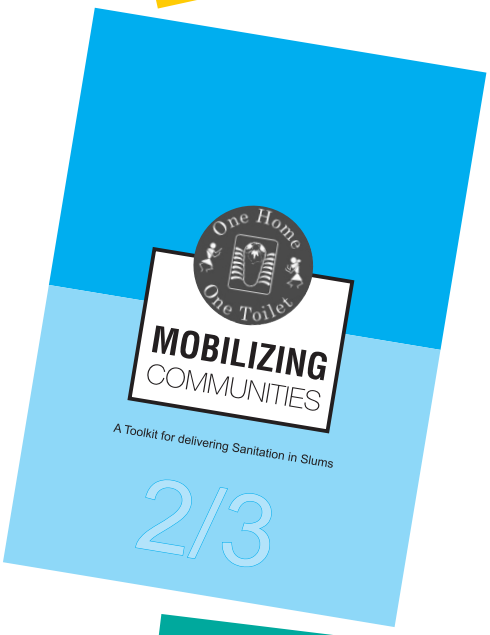
by **SHELTER ASSOCIATES**

TOOLKIT



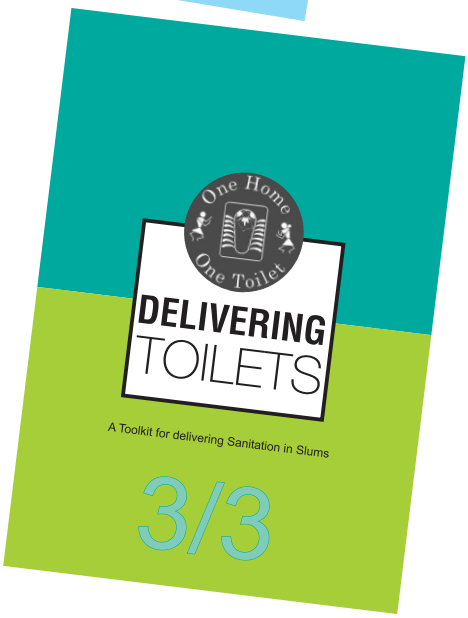
BOOKLET 1

CREATING SPATIAL DATA covers the primary stage of the OHOT model where the objective is to gain an understanding of the ground reality. Accurate data is required for sensitive and appropriate rehabilitation strategies and so should form the foundation of any intervention in an informal community. The meticulous collection of information is described in the booklet along with the spatial organisation of the data to create a data set that can be used to understand the sanitation situation of the community and plan interventions in the informal settlement. SA's use of data superimposed on Google Earth's remote sensing images to develop slum rehabilitation strategies earned SA the title of 'Google Earth Hero' in 2009 and has enabled SA to win competitions and pass due diligence tests for sanitation projects in Pune, Pimpri-Chinchwad, Sangli-Miraj, Navi Mumbai, Kolhapur, Khuladabad, Nashik, Thane, and Solapur.



BOOKLET 2

MOBILIZING COMMUNITIES covers the second stage of the OHOT model. The objective is to gain the support of the community and the benefit of their input and specialist local knowledge. Community support and input are both essential to the success of interventions as it ensures that projects will be appropriate for the local (sub)culture and it ensures that the community will perform their associated duties. This booklet includes the various meetings and sessions which are conducted with the community to establish a dialogue where an insight into the sanitation issues can be gained and where an understanding of the benefits of household toilets can be promoted.



BOOKLET 3

DELIVERING TOILETS covers the third stage of the OHOT model where the toilet units and any associated sewage connections are installed. OHOT toilets are made available on a cost sharing basis to the beneficiary where the cost of labour is borne by the beneficiary family and the materials and components required for the construction of the OHOT toilets are provided by funds donated by OHOT partners through their Corporate Social Responsibility (CSR) contributions.

The methodology developed and refined by SA aligns with the Government of India's Swachh Bharat Mission (Clean India Program), One Step Closer to Cleanliness, an initiative launched in 2014 with the intention of reducing incidence of open defecation and associated violations of a person's health, safety, and dignity by 2019; and the Ministry of Urban Development' and National Urban Sanitation Policy (2010) which states that the "provision of individual toilets should be prioritised." SA has observed that even though the policy is in place ULB's tend to continue to provide CTB's despite their well known issues due to an absence of accurate data, and that ULB's tend to implement projects without the input or support of the beneficiary communities. This situation provides an opportunity for the application of the OHOT model and is the rationale for the production of this toolkit.

Lack of adequate sanitation has a detrimental impact on the health, education, financial security, and safety of people living in informal settlements and costs India 6.4% of its GDP ($53.8 billion) each year. Lack of sanitation is not an indicator of poverty, it is a major contributing factor.

In the following chapters we will explain our data driven, community centric, and inclusive methodology and demonstrate how to implement projects which will contribute to making India open defecation free and render the associated violations of our most vulnerable citizens a thing of the past. It is our hope that State Governments, ULB's, NGOs, foundations, social entrepreneurs, donors, international aid and development agencies, international financial institutions, and any other interested parties will use this toolkit to implement impactful improved sanitation projects across India.

List of Abbreviations

AWO	Administrative Ward Office
CSP	City Sanitation Plan
CSR	Corporate Social Responsibility
FGD	Focus Group Discussion
GIS	Geographic Information Systems
GOI	Government of India
LER	Local Elected Representative
NGO	Non Government Organisation
NUSP	National Urban Sanitation Policy
ODF	Open Defecation Free
OHOT	One Home, One Toilet
PCC	Precast Cement Concrete
PVC	Polyvinyl Chloride
RAY	Rajiv Awas Yojana
RCV	Resident Community Volunteers
RHS	Rapid Household Survey
RIM	Rapid Infrastructure Mapping
SA	Shelter Associates
SBM	Swachh Bharat Mission
SHG	Self Help Groups
ULB	Urban Local Body
UNICEF	United Nations International Children's Emergency Fund
URI	Unique Reference Identity
WC	Water Closet
WHO	World Health Organisation
CTB	Community Toilet Block
PTB	Public Toilet Block

DELIVERING TOILETS

Booklet 3/3

Background

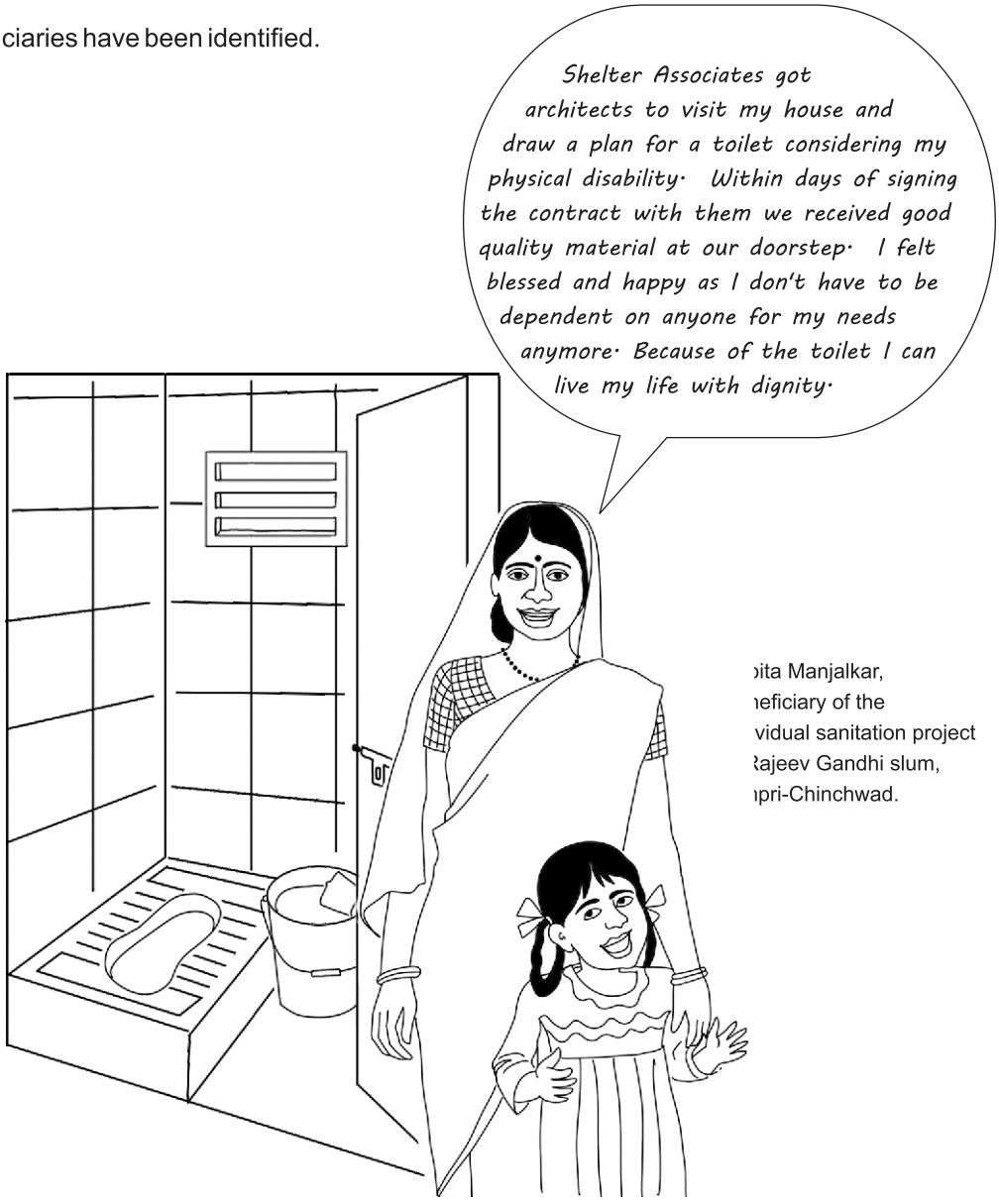
The objective of SA's OHOT initiative is to provide vulnerable families with an improved sanitation facility, which is defined by the World Health Organisation (WHO) and United Nations International Children's Emergency Fund (UNICEF) as a facility that hygienically separates human excreta from human contact, such as a toilet within or attached to their home. While Community Toilet Blocks (CTBs) can be considered improved sanitation facilities they are a less impactful option in relation to OHOT initiative for reasons which are discussed elsewhere in this toolkit. This booklet describes how OHOT toilets are constructed within homes in informal settlements. The prerequisites for this phase are:

1. That there is an understanding of the OHOT project context.

2. That there is an understanding of the extent and condition of the existing sewage infrastructure.

3. That the OHOT project has the support of the local community.

4. That potential beneficiaries have been identified.



ıita Manjalkar,
ıeficiary of the
vidual sanitation project
ɛajeev Gandhi slum,
ıpri-Chinchwad.

Signing of an Undertaking and Financing

Undertaking

Potential beneficiaries are visited for a full briefing of the construction phase of the OHOT project, including the anticipated time frame. Clarity regarding the sequence of events and the anticipated time frame is important as it provides notice to the beneficiary. This allows time for them to make arrangements to minimize the disruption of the construction phase on their daily activities and duties, which could include economic or educational activity. A sensitively executed program would be one that causes the least disruption to the OHOT beneficiary family and minimizes inconvenience.

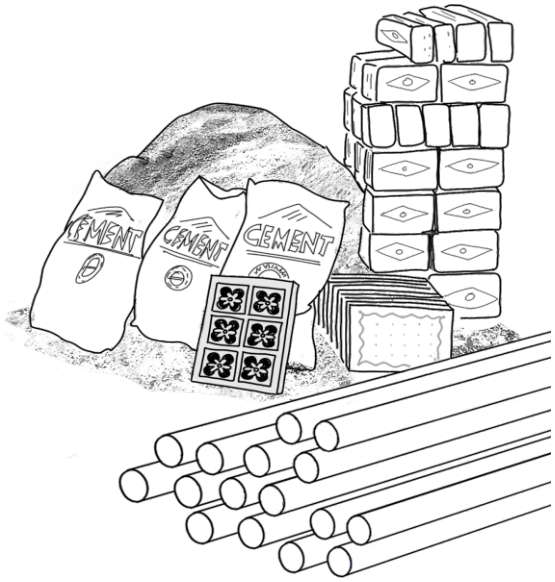
The beneficiary is provided with all necessary information at the meeting and given the opportunity to ask questions, raise any reservations, and sign the undertaking. The undertaking is a document which sets out the rights and responsibilities of the beneficiary and the OHOT implementing agency. The undertaking also includes a blank page to sketch the plan layout of the beneficiary's dwelling showing the indicative location of the OHOT toilet that will be constructed.

Financing

OHOT is a cost sharing procurement model where construction material and components are provided at the doorstep of the beneficiary's dwelling using OHOT funds raised through Corporate Social Responsibility (CSR). The beneficiary bears the cost of the labour required to construct the OHOT toilet.

This cost sharing arrangement creates a sense of ownership, secures the beneficiaries participation in the process, and ensures that: families cannot use the donated funds for any other purpose. If the family fails to commence the works, the construction materials can be redirected to another beneficiary within the informal settlement. This allows families to be invested in the project and hence are more likely to use the facility once it is completed. The families are encouraged to build toilets within their house so as to ensure that there is no encroachment in the existing lanes.

Process of Construction



The materials are provided in three phases to ensure their use for the purpose of constructing an OHOT toilet. From the day when the undertaking is signed an OHOT toilet is typically completed within a period of 10 days. Deliveries are phased to suit the program of construction activities and for all the OHOT implementing agencies to monitor the progress of development.

Construction Material toolkit: Phase wise distribution

PHASE	MATERIAL	QUANTITY
Phase 1	Cement	Four 60 kg bags
	Sand	1000 kg
	Bricks	230 bricks with the following dimensions:
		Length: 8” (200mm) Height: 6” (150mm)
		Width: 4” (100mm)
Phase 2	Orissa pan (squat style)	One unit
	P Trap	One unit
	PVC pipe	10' (3.0m) length with a diameter of 4” (100mm)
	PVC T junction	One unit
	PVC L junction	One unit with a diameter of 4” (100mm)
	Precast Cement Concrete (PCC)Jali	One 12” x 12” (300 x 300mm) unit
	PCC Chamber cover	One 16” x 22” (400 x 550 mm) unit
	PVC cowl	One unit
	Tiles	Sixty 8” x 12” tiles
	White cement	One 1 kg bag
	Solution One	100ml bottle
Phase 3	Door	One doorset 2'3” x 6' (0.6 x 1.8m)

Construction Timeline

Day 1	Day 2	Day 3	Day 4

PHASE 1
Upon receiving the first delivery of construction materials the beneficiary is obliged to start the first phase of construction and to complete the work within a period of three to four days.

Once the first phase has been recorded as complete by the OHOT implementing agency the second delivery of materials is dispatched.

Day 5	Day 6	Day 7	Day 8	Day 9

PHASE 2
Upon receipt of the second delivery of construction materials the beneficiary is obliged to start the second phase of construction and to complete the work within a period of four to five days.

Once the second phase has been recorded as complete by the OHOT implementing agency the final component, the door, is handed over to the beneficiary.

Day 10

PHASE 3
The door is fitted and the toilet is complete.

The cost of any requirement which is over and above the material toolkit is to be borne by the beneficiary for example additional tiles for greater extent of internal walls, installing a floor standing unit (English water Closet) or any additional pipes required to connect into the drainage system etc.

Checklists

There is a whole process that needs to be followed by the OHOT implementing agency even before the phase wise material distribution.

I. PROCUREMENT

To procure materials and components for OHOT projects a list of potential vendors should be generated and each contacted with a request to provide a quotation for provide their material/component. These quotations often have a decreasing unit rate as the quantity of units increases, so it is possible to take advantage of the economy of scale.

Once all quotations are received the process of analysis can commence. The analysis should not only compare the unit cost but a holistic price which includes the fee for the delivery and factors in the quality of the commodity on offer. The vendors themselves should also feature in the analysis:

1. Where is the vendor based?
2. What is the distance from the vendor's outlet to the project site?
3. Is the vendor able to meet the order?
4. Does the vendor have other orders which might make meeting the OHOT order difficult?
5. Is the vendor reputable and trustworthy?
6. If there was a problem who would be the vendor's point of contact?
7. Do you feel that you could resolve potential issues with that person?
8. Do you feel that you could work with the vendor?

II. QUALITY CONTROL

The quality of materials influence the outcome and therefore the impact of an OHOT project. The aim of OHOT projects is for the provision of individual toilets (the outcome) to improve the lives of individual families living within informal settlements in relation to their health, safety, and well-being indicators (the impact). If materials are of a substandard quality and have a short life span, then the outcome, and therefore the impact of the project is at risk. Below are some simple checks to gauge the quality of the principal construction materials.

A. BRICKS

Good quality bricks:

1. Will have a vivid and uniform colour and be fired well enough to have a dark red colour indicating an appropriate blending of all its constituents.
2. Will give a clear sound when struck together.
3. Will not break or crack when dropped from a height of 5' (1.5m).
4. Will not absorb more than 20% of their own weight when immersed in water for a period of 24 hours.
5. Will not have a dimensional variation from unit to unit by more than an acceptable tolerance.

B. CEMENT

Good quality cement:

1. Will have a uniform grey colour with a slight greenish shade.
2. Will feel smooth when touched and rubbed between fingers. A rough feel is an indicator that the cement has been adulterated with sand. Be sure to wash your hands after handling cement as it can cause damage to bare skin.
3. Will float prior to sinking when a small quantity of it is put into a bucket of water as it will have a low level of impurities and will have an appropriate density.
4. Will be free from lumps which form when moisture has entered the bag.
5. Will set and not crack when mixed with water into a thick paste and kept underwater for 24 hours.
6. Will feel cool and not warm if you place your hand within a bag/heap of it. A cool temperature would indicate that the cement is stable and no hydration is occurring within the cement.

C. SAND

Good quality sand:

1. Will feel coarse and contain sharp angular grains of various sizes.
2. Will be clean and free from organic or vegetable matter.

D. COMPONENTS

1. For all sanitary ware items and tiles; good quality products will carry registered trademarks such as the Indian Standard Institute (Bureau of Indian Standards since January 1st 1987).

III. DESIGN AND LAYOUT

The brief is to provide a new room within an existing dwelling within an informal settlement where the residents can expel waste from their bodies without coming into contact with the same waste. Accommodating this enclosure within an existing dwelling will require the reconfiguration of the layout to create a Water Closet (WC) within or adjacent to the dwelling, which can be used by the residents for good sanitation practices.

Key requisites for the OHOT toilet to have the desired impact are:

1. **Separation of human waste from human contact.**
2. **To provide privacy to the user for the duration of its use.**
3. **Be well lit. There should be a provision for artificial lighting when natural lighting is unavailable so that it can be used at any time of the day or night.**
4. **Be well ventilated. There should be provision of ventilation to ensure that the air changes through the course of a day to prevent the accumulation of foul air and moisture.**
5. **Be secure. Access cannot be gained by unauthorised persons.**
6. **Be safe to use, simple to clean, and easy to maintain.**

Any proposal therefore will necessitate an amount of remedial repairs to the dwellings superstructure, internal partitions, and finishes. These alterations should not have a detrimental effect on beneficiaries dwelling; the OHOT toilet must not:

1. Compromise the functioning of the dwelling especially if the floor area of the dwelling is being used for economic activity.
2. Compromise the safety of the beneficiaries. The enclosure of the dwelling must still be able to provide security for the inhabitants.
3. Compromise the health of the beneficiaries. The addition of the new toilet should not result in a reduced environmental condition; existing levels of natural light and ventilation should be maintained or increased.

Design Considerations for locating toilets within a dwelling

A. NATURAL LIGHT AND VENTILATION

In dwellings the positioning of the entrance, windows, internal doors, and partitions is of critical importance. The location of windows in the exterior envelope of the dwelling can affect the levels of natural lighting and the opportunity for natural ventilation.

As the sanitation facility is likely to be located against an external wall, to ensure that it can be ventilated, it is probable that the existing windows and therefore existing levels of natural light and natural ventilation will be affected by the insertion of the WC.

Existing levels of natural light and natural ventilation could be maintained with windows being relocated, the insertion of an opaque glazed panel in the toilet's internal door (allowing for the illumination of inner areas while maintaining privacy), or PCC jali for ventilation, etc.

B. ENTRANCE TO THE HOUSE AND LOCATION OF COOKING AREA

It is also likely that the insertion of the WC will impact the entrance door and the way that the residents will circulate within their dwelling. The relocation of an entrance and the location of the new internal WC door should be decided holistically with regard for the overall utility of the limited floor area.

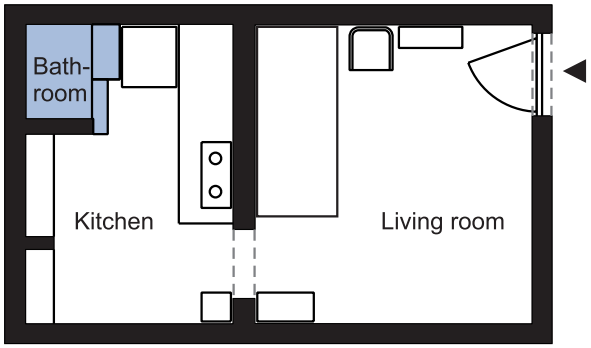
If the entrance and internal doors are positioned without any consideration for the dwelling as a whole then there is a danger that the new pattern of circulation will reduce the useable area of the dwelling.

Where possible the OHOT toilet should be sited in a remote position from where food is prepared. The new WC and the kitchen both require light and ventilation so achieving remoteness between the two spaces is difficult as they are competing for a position on a limited length of external envelope; in some cases only one side of the dwelling is an external wall as the other sides are party walls with neighbouring dwellings. Bathing spaces can be converted so that the space can be used as both for going to the toilet and bathing.

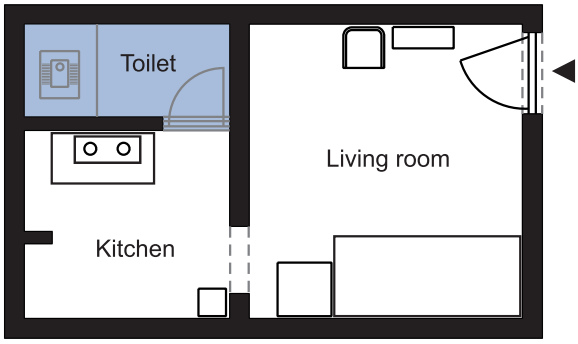
C. TOILET LOCATION WITHIN THE HOUSE

The OHOT toilet should be located within the dwelling to minimise the difficulty of forming connections to any sewage lines present within the vicinity. In cases where the positioning of the OHOT toilet is complicated relative to sewage lines, joint visits should be organised with Junior/Senior Engineers from the Sanitation Department of the Administrative Ward Office (AWO) to clarify and finalize the position of the OHOT toilet, and it's distance from the closest sewage line.

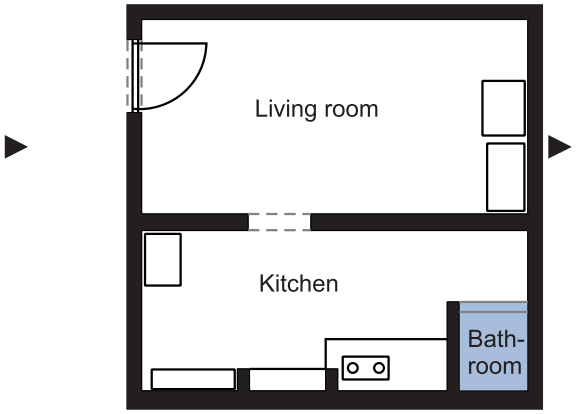
Examples of toilet placement in varying housing typologies:



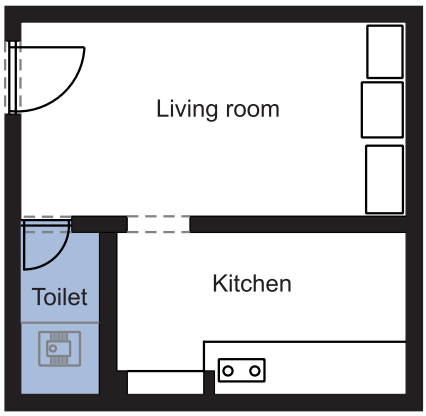
Plan before Shelter Associates' intervention



Plan after Shelter Associates' intervention

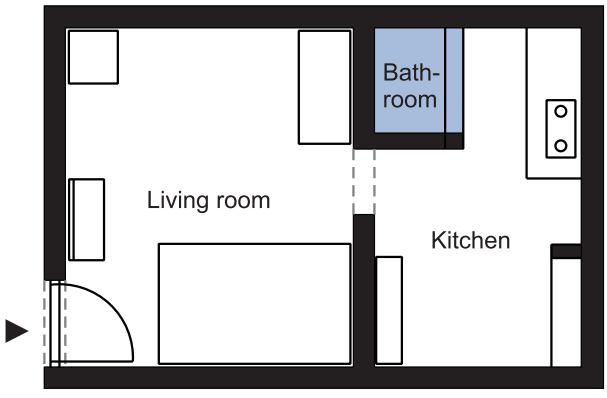


Plan before Shelter Associates' intervention

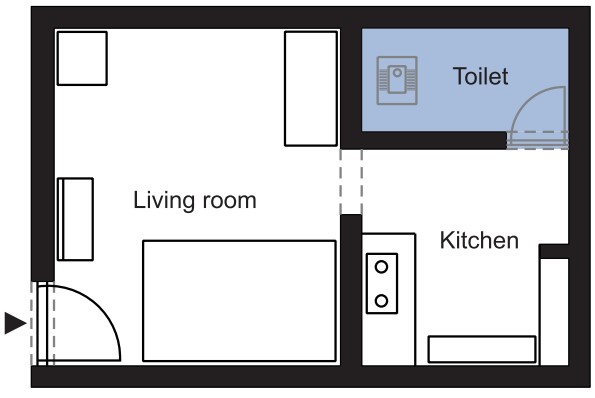


Plan after Shelter Associates' intervention

The house's plan, as seen before (left) and after (right) Shelter Associate's intervention. Prior to intervention, the household had a small bathroom, next to the kitchen at the back of the house and they used the community toilet block. Now they have constructed a proper toilet space which is also used as a bathroom. The kitchen platform was extended and the combined toilet and bathroom is conveniently located near the drainage line which runs under the street.



Plan before Shelter Associates' intervention



Plan after Shelter Associates' intervention

IV. OPERATIONS AND MAINTENANCE

An important design consideration is the operation and maintenance of the OHOT toilet. The OHOT toilet should not be constructed in a manner that prevents access for cleaning and maintenance. The sanitation facility should be designed so that the beneficiary is able to use the OHOT toilet safely, adopt a simple cleaning regime, is able to access all components to replace them if required, and able to clear any blockages that might occur during normal operation.

1. How will the beneficiary family flush away the waste? When low flush volumes (less than 5 litres) are used consideration will need to be given to the increased risk of blockages

2. How can a slight gradient be introduced into the floor of the OHOT toilet to ensure that water drains away and stops it from pooling?

3. How can the facility be designed to ensure that standing water is kept to an absolute minimum? Standing water is closely associated with waterborne diseases, and if the wastewater exits the facility by any means other than the drainage connection there is a chance that the wastewater might pollute valuable freshwater sources. The standing water can also be a slip hazard for the users of the toilet.

4. Does the beneficiary family have a preference with regard to the position they adopt when defecating? Do they prefer seated or squatting or would they like the option of both? Will a floor mounted 'squat style' pan be sufficient or would the beneficiary prefer to pay extra to swap to a floor standing pan?

5. Does the beneficiary family intend to use the facility for bathing and washing dishes? Will the amount of tiles be sufficient or would the beneficiary prefer to pay extra for additional tiles?

It is important to inform the beneficiary of the specification and supplier of all materials and components that were used to form their OHOT toilet so that they can arrange for any replacements or repairs that may be required through the life of the OHOT toilet.

V. DELIVERY OF MATERIALS AT DOORSTEP

Once the undertaking is signed the construction materials are delivered to the beneficiary's dwelling. During this work stage consideration must be given to the logistics of delivering construction materials and components to a location within an informal settlement. The success of the deliveries will depend on the forward planning and the arrangements made to mitigate issues:

1. How close can the materials be delivered to the OHOT project site in a vehicle?

2. How heavy are the materials? Will the materials have to be carried by hand?

3. Is there anything that can be used to make transporting them by hand easier (haat gadi)?

4. Are there any characteristics of the informal settlement that will make delivery by vehicle or by hand difficult?

5. Will the topography cause problems for delivery?

6. Will the monsoon affect the delivery of materials?

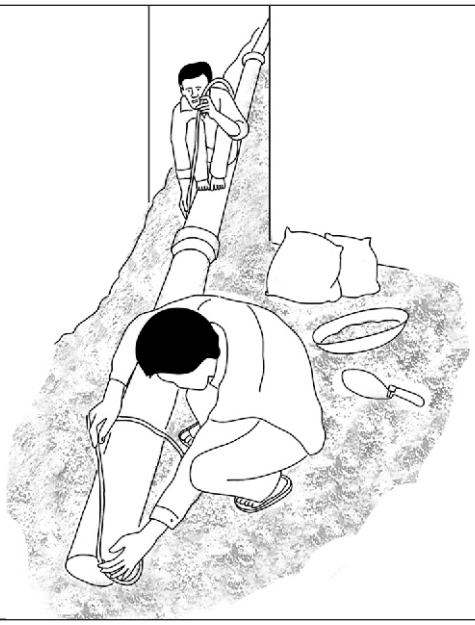
7. Will roads and lanes in or around the informal settlement flood or become otherwise impassable?

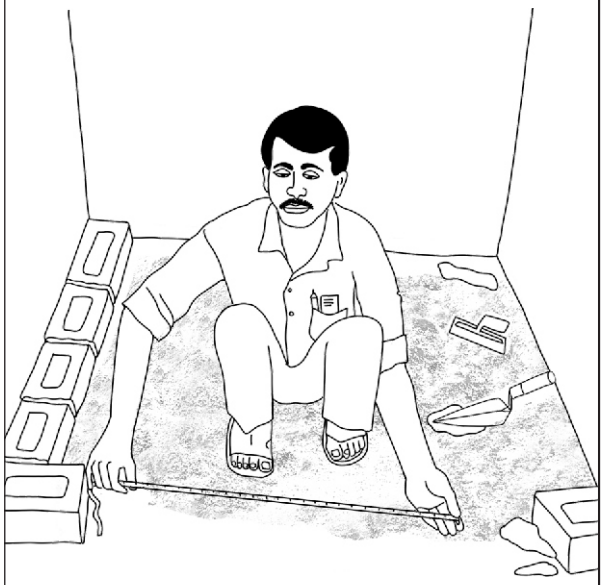
Under every section such as procurement, quality control, design and layout, operations and maintenance, and delivery of materials at doorstep, the list of questions is not exhaustive as there may be other pertinent questions that should be considered in order to effectively implement each of the processes.

Construction

During the Rapid Household Survey (RHS) work stage of the 'Creating Spatial Data' phase of the OHOT model, data will have been collected in relation to employment activity that will be of use to the beneficiary. As mentioned previously OHOT is a cost sharing procurement model where the beneficiary bears the cost of the labour required to construct the OHOT toilet. The beneficiary is free within the framework of the OHOT model to engage the services of any contractor. If the beneficiary is unaware of anyone that they could contact, the OHOT implementing agency can make them aware of contractors within the informal settlement which they could approach. As a secondary benefit is that this phase of the OHOT model has the potential to generate employment opportunities for the contractors within the local community. Where families are continually failing to start construction, the materials are requisitioned and provided to another OHOT beneficiary. Throughout the process of construction, OHOT team members make frequent visits to all OHOT beneficiaries to review progress and record milestones.

PHASE 1

	1. Check the invert levels of the chambers and sewage lines located near the proposed location of the OHOT toilet, so as to check the planned route the drainage connection.
	2. Demolition work and excavation to level the floor and prepare the area for the OHOT toilet to be constructed. All material should be removed carefully so that it can be reused for any remedial work required once the OHOT toilet is constructed.



3. Setting out:

The internal dimensions should be 3' x 4' (0.9 x 1.2m) as these dimensions coordinate with the tiles.

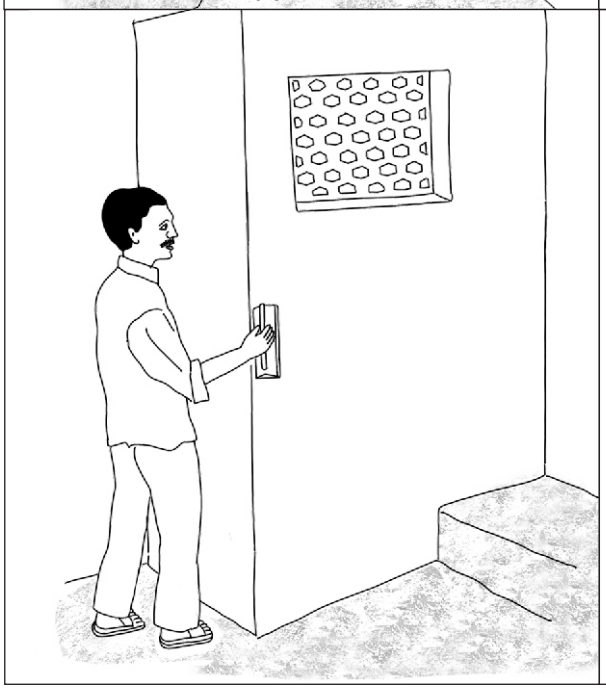
4. Masonry first phase:

Fix any required wall tie systems to tie the new walls into existing masonry, build walls upto a height of 3' 3" (1.0m) and check that the brickwork is level at each course, brickwork over 1m height should not be formed within 1 day due to the weight of the brickwork on the cement forming the joints.

5. Form a plinth for the pan with brickwork.

6. Masonry second phase:

Build walls upto a height of 6' 6" (2.0m), the enclosure that forms the toilet should ensure privacy to the beneficiary during use.



7. Fit jali:

The enclosure should have an opening (other than the entry door) to permit natural light to enter and to enable air to circulate.

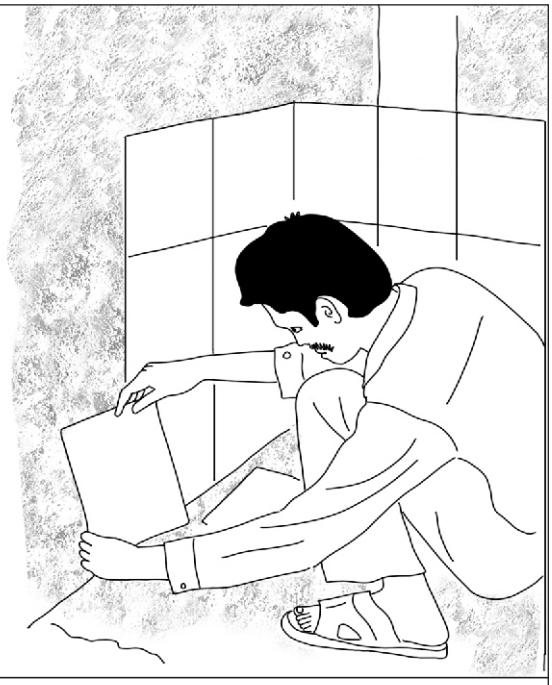
8. Cement render finish (or similar):

The external walls of the OHOT toilet enclosure should not have a pervious finish.

PHASE 2

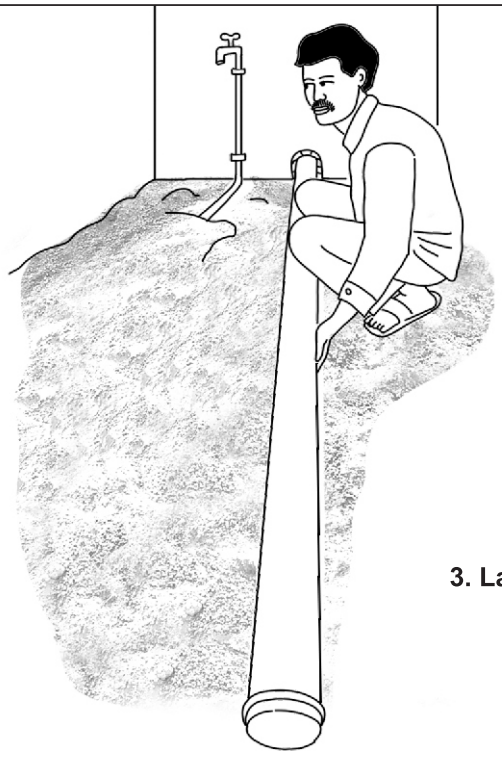
1. Fit pan:

While fitting a pan, water seal - which is a key feature of an effective sanitation facility, needs to be considered. It is the interface between the WC which accommodates the toilet pan and the waste management system. Foul air/noxious gases should not be able to enter the WC from the waste management systems.

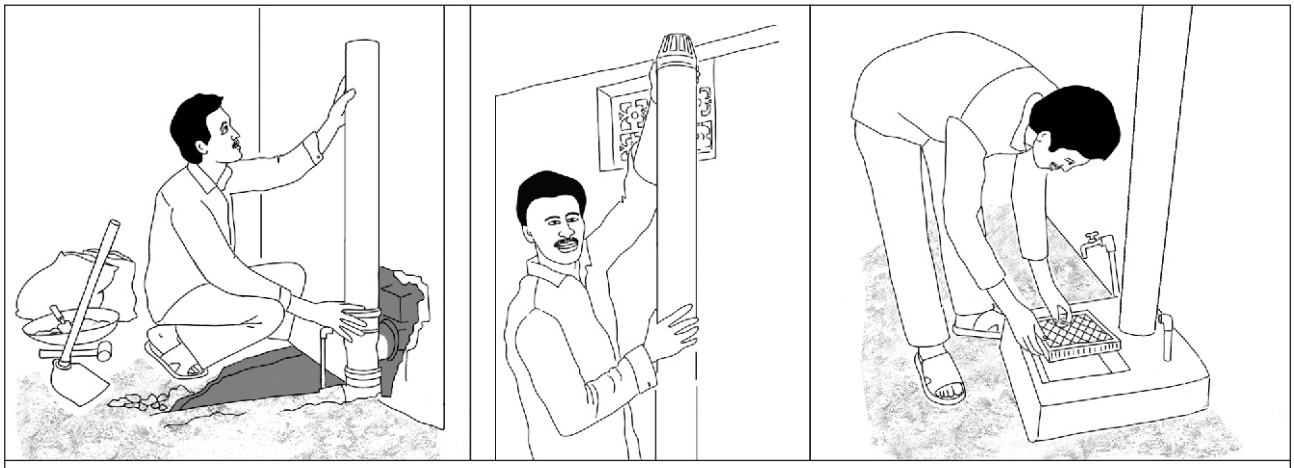


2. Fit tiles:

Tiles are fitted upto a height of 3' (0.9m) to protect the interior face of the brickwork from water splashes during use and cleaning of OHOT toilet. If the room is intended to be used for bathing the beneficiary could be offered the option of paying for additional tiles to protect the inside face of the walls upto a height of 6' (1.8m).



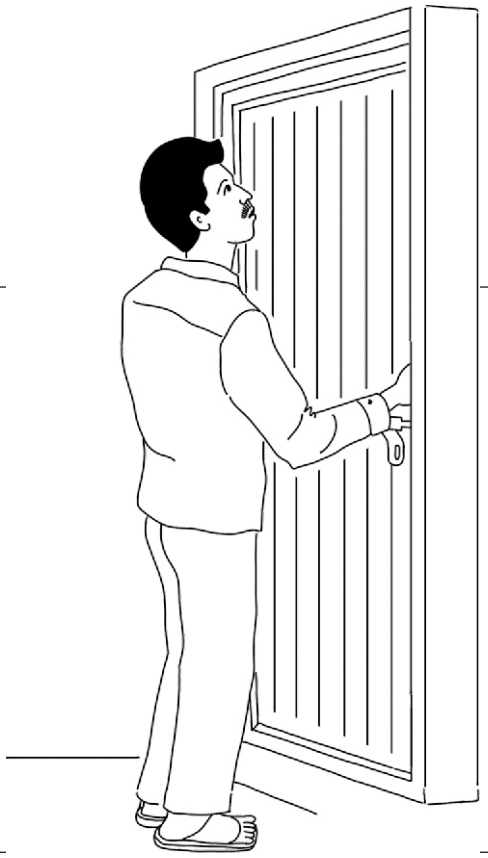
3. Lay sewage pipe and P trap for service connection.



4. Fit ventilation stack, cowl, and associated mesh:

The sewage pipe connecting the OHOT toilet to the sewage management system must be ventilated to function properly. The ventilation stack should terminate 3' (900mm) above the height of any openings into nearby dwellings such as windows or doors that are less than 10' (3.0m) from the ventilation stack. This ensures that noxious gas does not vacate the sewage system and enter into nearby dwellings. It is possible that the nearby opening could be a first floor window which would mean that ventilation stacks taller than two storeys would be required. The ventilation stack is required to be capped with a cowl to prevent vermin and insects from exiting the sewage system and spreading diseases.

PHASE 3



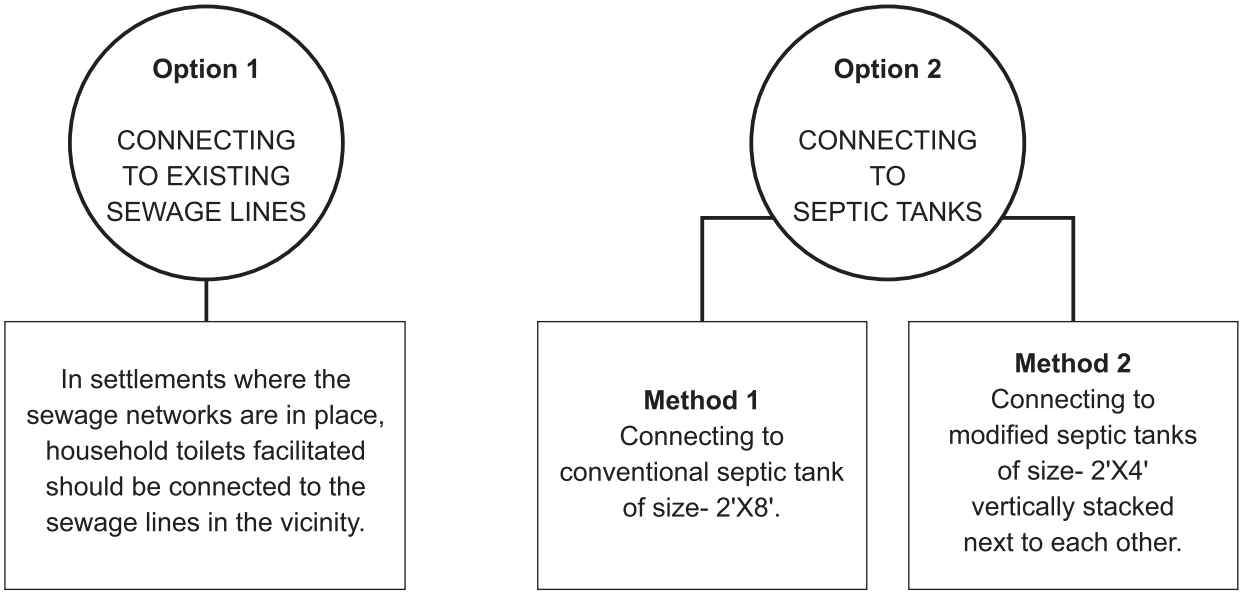
1. Fit door:

Fixtures on the door such as lock/latches should be fitted in accordance with the manufacturer's recommendations to ensure that they function correctly.

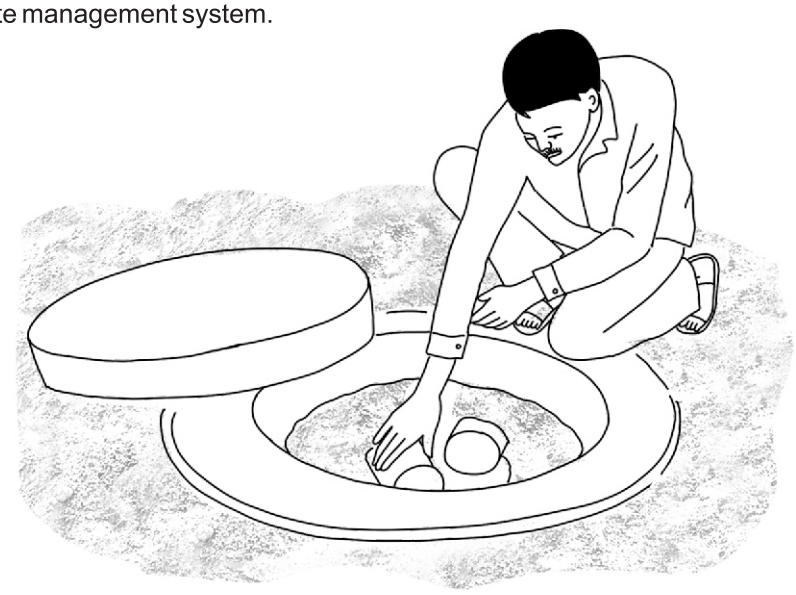
Waste Management

During the Rapid Infrastructure Mapping (RIM) work stage of the 'Creating Spatial Data' phase of the OHOT model, data regarding the extent and condition of any existing sewage infrastructure will have been established. An important prerequisite for the construction phase is the understanding of the extent of sewage infrastructure in order to determine the waste management strategy.

In order for the toilet to function it must be connected to a system which removes the waste from the informal settlement or processes it within the informal settlement to render it inert.
To achieve either of these there are two options:



For either of the options stated above, the waste connection should ideally function with minimal difficulty and no blockages. Parameters like gradient, length, diameter of drainage lines are to be factored in to enable smooth functioning of the waste management system.

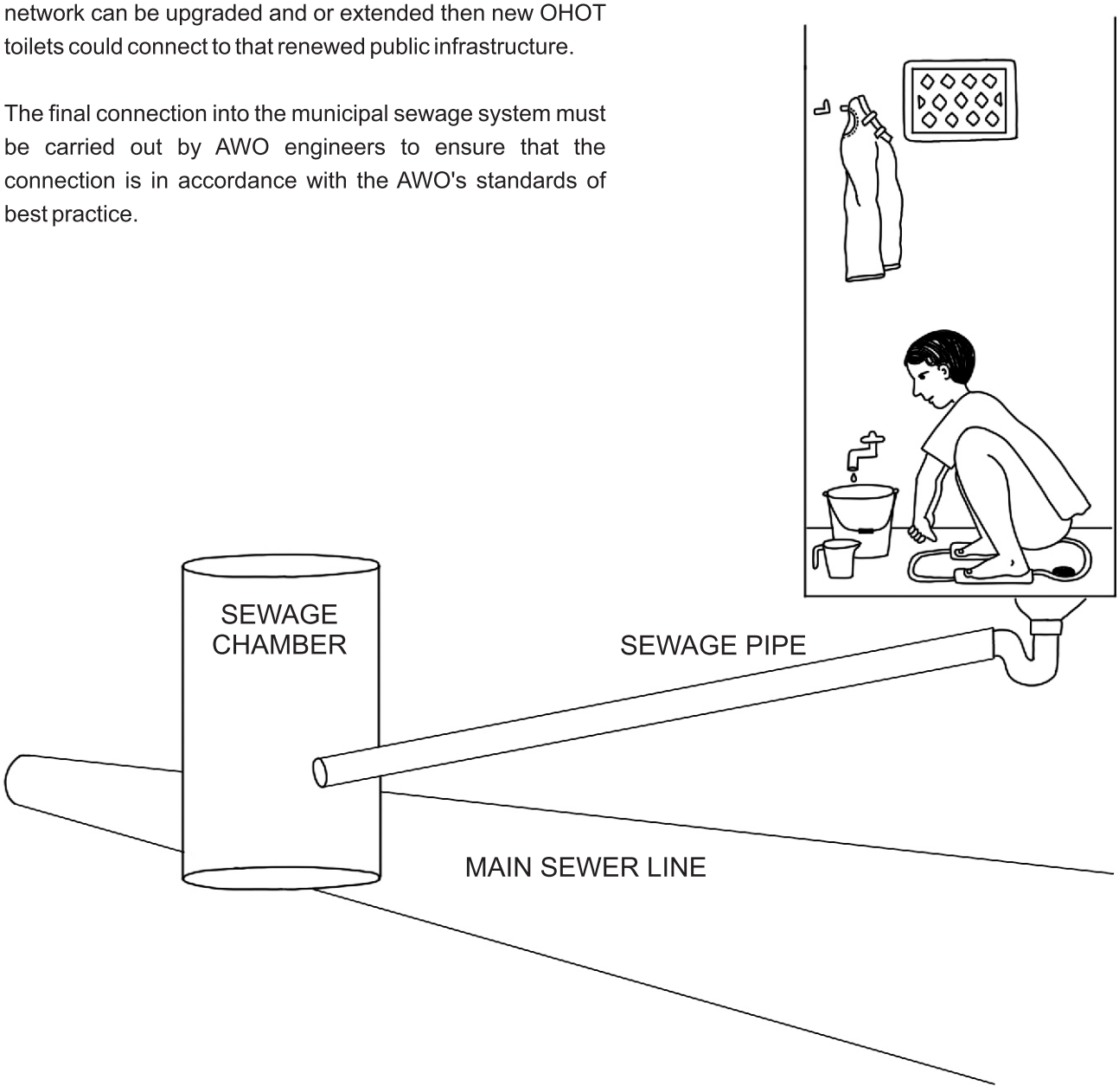


Option 1
CONNECTING TO AN EXISTING SEWAGE LINE

If there is an existing municipal sewage infrastructure network that can support the additional waste generated by new OHOT toilets then that network should be utilised and the OHOT toilets should be connected into it.

If there is an existing municipal sewage infrastructure network that cannot support the additional waste generated by new OHOT toilets, then upgrades to the sewage system should be sought with the AWO as part of the Government of India's (GOI) Swachh Bharat Mission (SBM). If the existing network can be upgraded and or extended then new OHOT toilets could connect to that renewed public infrastructure.

The final connection into the municipal sewage system must be carried out by AWO engineers to ensure that the connection is in accordance with the AWO's standards of best practice.



Option 2
CONNECTING INTO A SEPTIC TANK

Where there is no existing municipal sewage infrastructure network, or where there is an inadequate system that cannot/will not be upgraded, a septic tank can be an appropriate option.

Septic tanks utilize the bacteria present in fecal matter to treat the foul water. A septic tank is a partitioned vessel which retains the foul water for a period of time to allow bacteria to break down the solid waste into liquid and gases. The duration that the waste spends within the systems is dictated by the number of compartments that the tank is divided into. The longer the waste spends within the system the more time it has to break down and the more inert the output from the tank.

SA USES TANKS WHICH HAVE THREE CHAMBERS.

Waste water drains from the toilet into the first chamber where the solid matter is broken down, any solid waste that cannot be broken down by the bacteria settles at the bottom and must be removed periodically as part of the septic tanks maintenance.	▶ The liquid (and some suspended solids) at the top of the septic tank flows over the dividing partitions and into the next chamber where further settlement and dissolution occurs.	▶ The liquid near the outlet pipe vacates the septic tank and either is absorbed into the ground or is directed into a gutter to drain away.

The system is powered by the buoyancy principle; as 5 litres of urine and faeces enter the tank, 5 litres of wastewater are pushed from chamber 1 over the dividing partition into chamber 2. Which in turn pushes 5 litres of wastewater over the dividing partition into chamber 3. Which in turn pushes 5 litres of waste water out of chamber 3 through the outlet pipe. To stop the accumulation of gases the septic tank must be ventilated with a pipe that leads from the tank to outside.

The limitations of this option are that:

1. The toilet cannot be used for bathing as the waste water from a bath could kill the bacteria living in the septic tank.

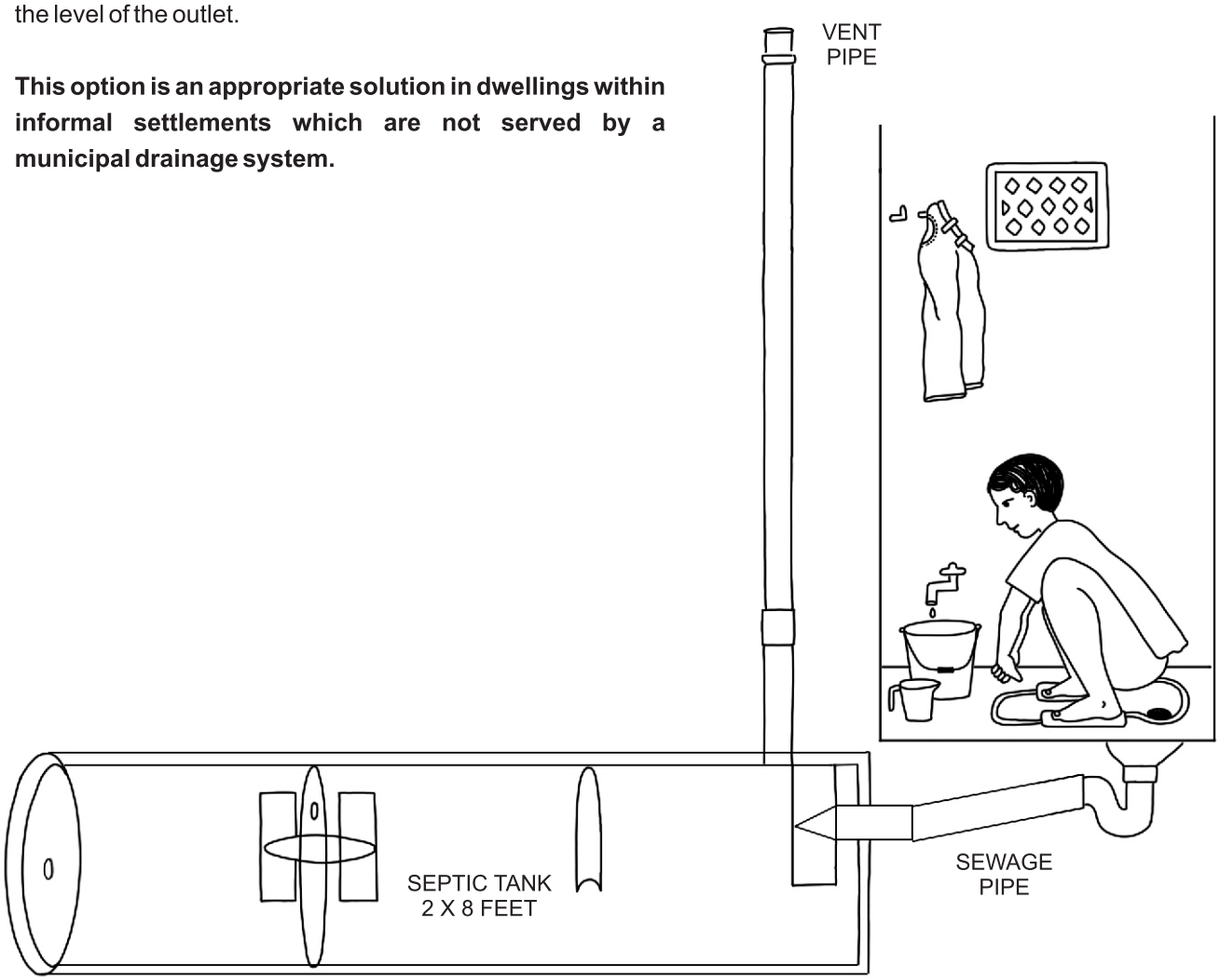
2. The septic tank must be transported to the project site, which could be problematic due to the size of the tank relative to the width of the access roads and lanes.

3. The septic tank will require ongoing access for maintenance. The sluice that collects at the bottom of the chambers is required to be removed periodically.

Option 2
METHOD 1- Horizontal Arrangement

Where the widths of the lanes is sufficient SA uses conventional 8' (2400mm) long with a diameter of 2' (600mm) diameter septic tanks placed length ways below the base if the OHOT toilet where a 4" (100mm) differential is maintained between the level of the inlet and the level of the outlet.

This option is an appropriate solution in dwellings within informal settlements which are not served by a municipal drainage system.



Note: On commencement of use of the toilet connected to a septic tank, after the first four days- it is advisable to pour the following mixture into the toilet pan to accelerate the generation of bacteria:
Juice extracted from four lemons is to be mixed with four egg yolks to prepare the mixture.

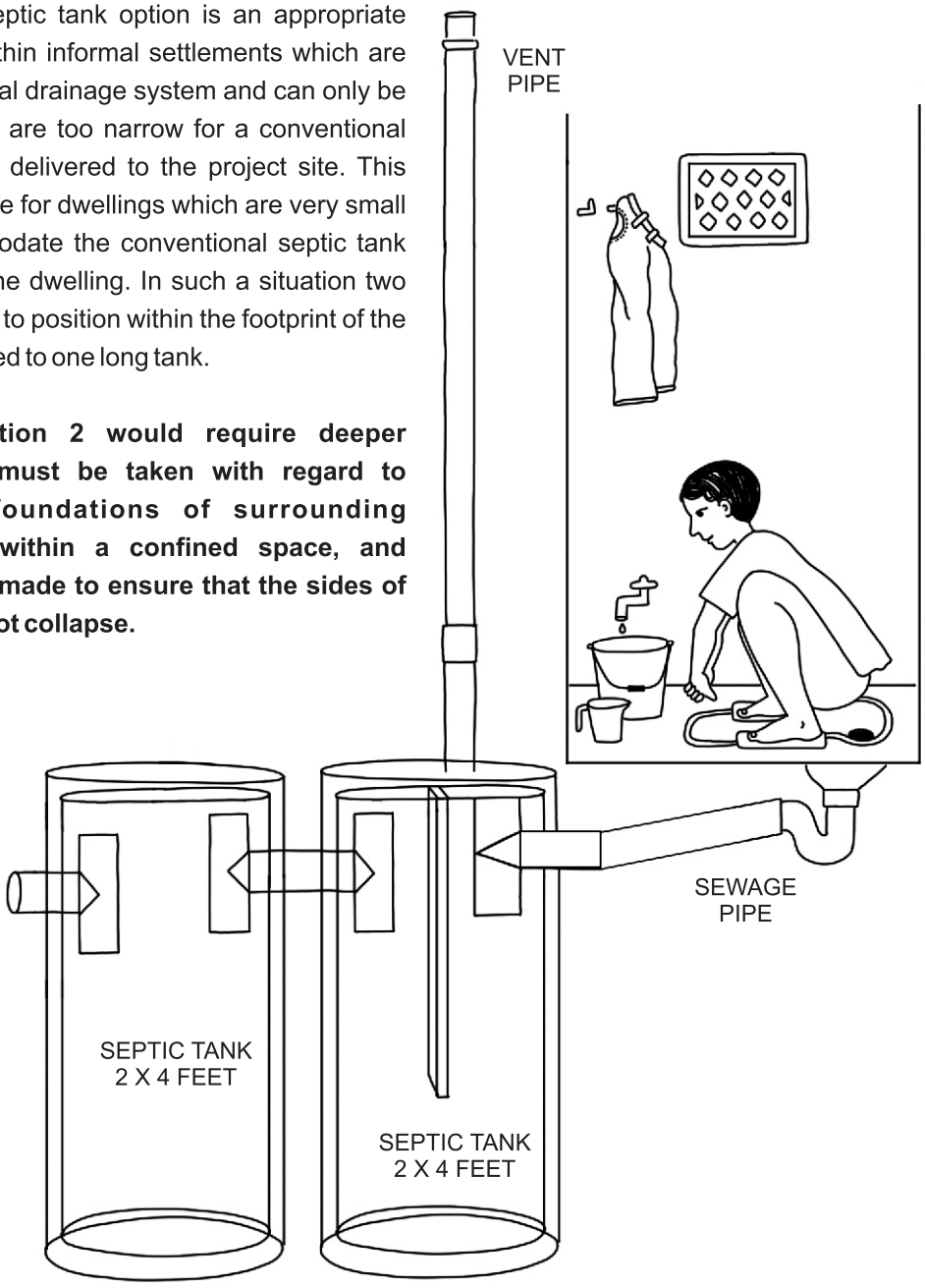
Option 2
METHOD 2- Vertical Arrangement

Where it has been recorded during the RIM work stage that the lanes are too narrow for the delivery of septic tanks of a conventional size, SA have developed a septic tank system which can easily be manoeuvred into difficult areas to reach locations. Two tanks 4' (1200mm) long with a diameter of 2'(600mm) are placed side by side and connected with a 4" (100mm) pipe to create the two compartments which are necessary for the system to function. These two tanks are placed below the base of the OHOT toilet where a 4" (100mm) differential is maintained between the level of the inlet and the level of the outlet.

The first tank is subdivided into two compartments so that both tanks together create the three compartments necessary for the system to operate.

This variation of the septic tank option is an appropriate solution in dwellings within informal settlements which are not served by a municipal drainage system and can only be accessed by lanes that are too narrow for a conventional sized septic tank to be delivered to the project site. This option is also appropriate for dwellings which are very small and unable to accommodate the conventional septic tank within the curtilage of the dwelling. In such a situation two smaller tanks are easier to position within the footprint of the small dwelling as opposed to one long tank.

This version of option 2 would require deeper excavation so care must be taken with regard to undermining the foundations of surrounding structures, working within a confined space, and provisions should be made to ensure that the sides of the deeper trench do not collapse.



Documentation

Once each OHOT toilet is built, connected to a drainage system and ready for use, SA conducts a quick survey in each household to record the status and document the OHOT toilet.

The data provided by the beneficiary family is used to produce a fact sheet which serves as a summary document and presents the key information concisely including the location of the OHOT toilet expressed using latitude and longitude coordinates. The fact sheets which attest to the OHOT toilets being facilitated, are shared with OHOT donors/funders, and uploaded onto the SA website where it is freely available to view. In cases where the OHOT toilet is part of an AWO's SBM initiative the fact sheet is also required to be uploaded to the SBM portal.

The documentation survey and fact sheets also serve to collect and communicate anecdotal impact as the OHOT beneficiary has the opportunity to describe how having access to their own household toilet has impacted their daily lives in relation to their health, their safety, and their dignity.

INDIVIDUAL TOILET FACTSHEET

Sainath Wadi Airoli : 101

Slum Information

Name of Settlement	**Sainath Wadi Airoli**
Settlement address	**Sainathwadi Sec.1 Aroli**
House number	**101**

Family Information

Name of the family head	**Mr. Parag Dinesh Sorthiya**
Name of Native village, district and state	**Ambleri**
Duration of stay in the city	**3 Years**
Duration of stay in this current settlement	**2 Years**
Type of house	**Semi-pucca (Semi-permanent)**
Owner or tenant	**Tenant**

Family Members

Total family members	**2**
Total male/ Female members	**1 / 1**
Number of children under 5 years of age	**0**
Number of members over 60 years of age	**0**
Number of girl children between 0-18 yrs	**0**
Number of disabled members	**0**
If yes, specify type of disability	
Occupation(s) of earning members	**Other**
Approximate monthly family income	**Rs.10000**
Have you upgraded your toilet/bathroom/ house while constructing individual toilet	**Only toilet**
Cost of upgradation	**Rs.10000**
Note	**Mr.Hindurao Tatyarao Pawar Owner Of This House**

June 2017

For more information, please visit our website

www.shelter-associates.org

ANNEXURE 1- Undertaking for toilets to be connected to existing sewage line.

shelter associates

A/17, Sarasnagar Siddhivinayak Society, Opposite Nehru Stadium, Shukrawar Peth,Pune - 411002
Telephone : 020 24440363 info@shelter-associates.org www.shelter-associates.org

Ms/Mr. .....

Address: .....

House Number: .....

I hereby solemnly affirm and undertake that, I do not have an individual household toilet and I have not been a part of 'Swachh Bharat Mission' scheme. I am being facilitated with an individual household toilet under the 'One Home One Toilet' initiative by Shelter Associates.
I am an owner/tenant of the house mentioned above. Being a tenant,

House owner's name- .....

House owner's address- .....

House owner's contact number- .....

On receiving all the construction materials from the organization, I shall bear the cost of construction and construct a toilet in the house mentioned above. I ensure that I shall use the construction materials provided for toilet construction. Also, I take full responsibility of the construction materials provided to me and I shall monitor the construction process and be responsible for getting it completed. I shall check the quality & quantity of the construction materials provided during the material distribution process. During the construction process, if any material is misplaced, I shall take responsibility in procuring the same and complete the construction. Shelter Associates is providing construction materials for the use of constructing toilets only. I shall be responsible for the construction process & the quality check will also be ensured by me. In future, if I come across any problems, I shall solely be responsible for them.

Shelter Associates has denied me the permission to get a toilet constructed on the upper floor. Yet, if I happen to get it constructed, it will be my duty to get water proofing done for the same. In future, if any problems are encountered regarding either water proofing or toilet construction, it will be my responsibility and I shall not hold Shelter Associates responsible for it. In case of any repair works I will bear the cost for the same.

The constructed toilet shall be put to right use for it's due purpose and for no other purpose. If I happen to rent out my house to a tenant, I shall grant them the permission to use the toilet. In future, I shall cooperate if I am asked for any information related to availing this facility. Also, I will ensure usage of the materials provided for their cause and not abuse any of it. In case I indulge in abusing the given material, I shall be legally penalised for the same.
.
The mentioned construction work will be carried out in phases. On receiving the 1st phase of construction materials, I shall immediately start construction work & I will be obliged to complete this work within 10 days. On completion of construction work, getting the toilet connected to the respective drainage line will be my responsibility, after which me & my family will start using this toilet.

Facilitator – Shelter Associates, Pune.

Within 2-3 days after signing the undertaking between Shelter Associates & the beneficiary, construction materials will be provided. Materials will be delivered at a point where the delivery vehicle can have easy access. There onwards, the materials will have to be physically carried by the beneficiary upto their house. Any other civil work required to get the toilet constructed will be the beneficiary's responsibility. Under Shelter Associates' OHOT scheme, masonry work of 4” is to be considered. If anyone wishes to get 6” masonry work done, they will have to bear the

additional cost of materials & masonry work. Along with a toilet, if the beneficiary is interested in getting a bathroom constructed, it will be his/her responsibility wholly.

Construction work should be completed within 10 days from receiving the construction materials. Construction materials will be provided in phases. On delivery of 1st phase of construction materials, if work is not completed within a week, the distributed materials will be withdrawn/ confiscated. While doing so, if any change in quantity when returning the materials is observed, it's equivalent amount will be recovered from the beneficiary.

I have read the above clauses in the right state of mind and I am not pressurized to sign this undertaking. This undertaking holds true & if found to be false, I will be ready to face any legal action.

Regards

Name of Beneficiary:

Ms/Mr. .....

Beneficiary's signature: .....

Name of Witness 1

.....

Witness's house number

.....

Witness's signature

.....

On behalf of Shelter Associates, Pune

Name of facilitator:.....

Facilitator's signature:.....

Name of Witness 2

.....

Witness's house number

.....

Witness's signature

.....

LOCATION OF INDIVIDUAL TOILET - PLAN

ANNEXURE 2- Undertaking for toilets to be connected to septic tanks

shelter associates

A/17, Sarasnagar Siddhivinayak Society, Opposite Nehru Stadium, Shukrawar Peth,Pune - 411002
Telephone : 020 24440363 info@shelter-associates.org www.shelter-associates.org

Ms/Mr. .....

Address: .....

House Number: .....

I hereby solemnly affirm and undertake that, I do not have an individual household toilet and I have not been a part of 'Swachh Bharat Mission' scheme. I am being facilitated with an individual household toilet under the 'One Home One Toilet' initiative by Shelter Associates.
I am an owner/tenant of the house mentioned above. Being a tenant,

House owner's name- .....

House owner's address- .....

House owner's contact number- .....

On receiving all the construction materials from the organization, I shall bear the cost of construction and construct a toilet in the house mentioned above. I ensure that I shall use the construction materials provided for toilet construction. Also, I take full responsibility of the construction materials provided to me and I shall monitor the construction process and be responsible for getting it completed. I shall check the quality & quantity of the construction materials provided during the material distribution process. During the construction process, if any material is misplaced, I shall take responsibility in procuring the same and complete the construction. Shelter Associates is providing construction materials for the use of constructing toilets only. I shall be responsible for the construction process & the quality check will also be ensured by me. In future, if I come across any problems, I shall solely be responsible for them.

Shelter Associates has denied me the permission to get a toilet constructed on the upper floor. Yet, if I happen to get it constructed, it will be my duty to get water proofing done for the same. In future, if any problems are encountered regarding either water proofing or toilet construction, it will be my responsibility and I shall not hold Shelter Associates responsible for it. In case of any repair works I will bear the cost for the same.

The constructed toilet shall be put to right use for it's due purpose and for no other purpose. If I happen to rent out my house to a tenant, I shall grant them the permission to use the toilet. In future, I shall cooperate if I am asked for any information related to availing this facility. Also, I will ensure usage of the materials provided for their cause and not abuse any of it. In case I indulge in abusing the given material, I shall be legally penalised for the same.

.

The mentioned construction work will be carried out in phases. On receiving the 1st phase of construction materials, I shall immediately start construction work & I will be obliged to complete this work within 10 days. On completion of construction work, getting the toilet connected to the respective drainage line will be my responsibility, after which me & my family will start using this toilet.

Facilitator – Shelter Associates, Pune.

Within 2-3 days after signing the undertaking between Shelter Associates & the beneficiary, construction materials will be provided. Materials will be delivered at a point where the delivery vehicle can have easy access. There onwards, the materials will have to be physically carried by the beneficiary upto their house. Any other civil work required to get the toilet constructed will be the beneficiary's responsibility. Under Shelter Associates' OHOT scheme, masonry work of 4” is to be considered. If anyone wishes to get 6” masonry work done, they will have to bear the

additional cost of materials & masonry work. Along with a toilet, if the beneficiary is interested in getting a bathroom constructed, it will be his/her responsibility wholly.

Construction work should be completed within 10 days from receiving the construction materials. Construction materials will be provided in phases. On delivery of 1st phase of construction materials, if work is not completed within a week, the distributed materials will be withdrawn/ confiscated. While doing so, if any change in quantity when returning the materials is observed, it's equivalent amount will be recovered from the beneficiary.

Once the location of the toilet is fixed, in cases where septic tanks are to be provided, the beneficiary has to take up the entire responsibility of getting the toilet constructed; right from bringing in the septic tanks from a location where vehicles have easy access, to excavating a pit of the required size for the tank, installing the tank and all the labour work force required for the excavation is the responsibility of the beneficiary and he/she shall bear the entire cost for the same.

The beneficiary shall ensure that no excess water is utilised after using the toilet. Also, he/she shall strictly not dispose any plastic, fabric, wrappers, cigarette butts etc. in the pan and in case any technical problem arises, the beneficiary shall solely be responsible for it. Detailed information regarding the use and maintenance of the toilet to be constructed has been explained by Shelter Associates. In near future, if the septic tank fails to function properly due to any odd reason, it shall not be the responsibility of Shelter Associates to get it repaired. In case any losses are incurred during/after the construction of the toilet due to which the toilet is not being used, SA shall recover the construction materials cost from the beneficiary.

I have read the above clauses in the right state of mind and I am not pressurized to sign this undertaking. This undertaking holds true & if found to be false, I will be ready to face any legal action.

Regards

Name of Beneficiary:	On behalf of Shelter Associates, Pune
Ms/Mr.	Name of facilitator:.....
Beneficiary's signature:	Facilitator's signature:.....
Name of Witness 1	Name of Witness 2
.....	.....
Witness's house number	Witness's house number
.....	.....
Witness's signature	Witness's signature
.....	.....

LOCATION OF INDIVIDUAL TOILET - PLAN

ANNEXURE 3- Critique of CTBs

In 1999 SA were invited by the Pune Municipal Corporation (PMC) to participate in a community toilet block (CTB) project. The then PMC Municipal Commissioner's idea was revolutionary as this was the first time that the PMC brought beneficiaries into the process of sanitation provision in their slums. SA's involvement in this initiative started with an analysis of the reasons why CTBs, which were being procured by the PMC and many other Urban Local Bodies (ULB) across India, were failing to realise their designed impacts. SA identified issues ranging from the procurement process, the design of the facilities and the CTBs operation and maintenance strategy. The issues were all found to reduce the success of the CTB projects.

The majority (70%) of the slums in Pune were not connected to the sewage network which meant that the CTBs were connected to aqua privy tanks. The aqua-privy tanks were not an appropriate solution for sewage waste management as they blocked easily and frequently cracked allowing untreated sewage to seep into the surrounding area and contaminating the site. Once the area around the CTB was soiled, the communities began to dump household waste there which in turn attracted flies, mosquitoes, and pigs and further reduced the sanitary condition of the settlement.

The toilet seat to person ratio was incredibly high which meant that beneficiaries were required to wait in a queue at peak times, which was frustrating, uncomfortable and inconvenient for the community. The inadequate seat to person ratio also meant that toilets were frequently blocked and the cleanliness of the facilities deteriorated; the huge numbers of people using each CTB meant that the daily cleaning by the PMC employees was ineffective and did little to keep the toilets clean. In case where the CTBs were also found to have an inadequate water supply the level of cleanliness was even worse. The CTBs also had no provision for small children whose only option, therefore was to defecate out in the open on the ground around the CTB. The practice of open defecation (OD) along with the effluents evacuating the privy tanks made the outbreak of diseases, such as diarrhea, common in the slums.

The inconvenience of using the CTBs and the poor sanitary conditions in and around the CTBs meant that the communities practised OD thereby exposing themselves to health and safety risks such as disease, physical attack and sexual assault. The safety aspect of poor sanitation in slums cannot be overstated as SA found that many women and girls restrict their intake of food and drink during the day to reduce their need to go to the toilet and reduce their risk of exposure to Eve teasing, sexual harassment and sexual assault. This strategy can have severe consequences for their health and cognitive development and, if the women are pregnant this strategy can also be detrimental to the health and development of the unborn child.

The community members themselves did not treat the facility as a valuable community resource. SA found that often members of the community would not leave the toilet in an appropriate state for the next user and also observed in some cases that fixtures and fittings had been vandalised and/or stolen. Had the community been involved in the procurement and design of the facilities they might have placed a greater value on them and felt a collective responsibility for their condition and maintenance.

SA found problems with CTB projects not only at a community level but also at level of the Urban Local Body (ULB). It was found that most ULBs used CTBs to address the sanitation needs within informal settlements as the PMC lacked accurate data regarding the extent and condition of existing sewage infrastructure. In the absence of data the CTBs severed as a default proposal where projects were designed and implemented without the input or support of the beneficiary community. This methodology may have seemed simpler than bespoke proposals based on accurate data but in reality created significant problems for the ULBs. Firstly the initial expenditure to build a CTB was high, and secondly the budgetary allocations made for their maintenance represented a substantial portion of the administrative ward offices budget which was a recurring commitment.

Informed by an understanding of the issues with CTB projects at both the community level and the ULB level SA partnered with Baandhani, an informal federation of men and women from informal settlements in Maharashtra. Baandhani surveyed, counselled and mobilised the communities with whom the SA team planned and refined the proposed CTB projects prior to their implementation.

Through this inclusive approach SA designed CTBs which addressed issues raised by the beneficiaries and addressed the problems experienced by the ULB; water connections were made mandatory and the aqua privies were replaced by septic tanks. Another design feature was the inclusion of 'baby channels' within the female section to provide a place for young children to defecate. SA's CTBs were designed to include a residence for a caretaker and their family thereby providing on-site maintenance; the caretakers were also responsible for collecting the monthly fee from each household that used the CTB to cover the cost of keeping the CTB clean and operable. SA's CTBs were procured with the input and support of the beneficiaries which meant that the communities valued the CTBs as an important resource which they had a collective responsibility to maintain.

Despite the success of SA's CTB projects the NGO has shifted focus to projects where data is collected and analysed so that improved sanitation can be provided in a more targeted fashion. SA now facilitates access to improved sanitation on an individual basis where each home has its own toilet; One Home, One Toilet (OHOT). SA's OHOT projects have a high degree of community support, are more convenient to use, are usable by young children, are connected to municipal services and do not require a high financial commitment from the ULB. The individual toilets are also safer than defecating out in the open or visiting a CTB so women find it more convenient and find it easier to practice menstrual hygiene.

SA's investigation into CTB projects illustrated that a data-led development process could lead to more targeted, cost effective and sustainable solutions to India's sanitation crisis. This realisation led to the establishment of what has become the cornerstone of SA's culture and working methodology: poverty mapping.

While CTBs can be defined as improved sanitation facilities SA's assertion is that CTB projects do not represent value for money as they are ineffective, expensive to procure and the high costs associated with maintenance make them unsustainable. They also require a large area to site the building meaning that they are not practical in informal settlements without open space or, if the informal settlement has open space, they consume open space which could be put to better use by the community. Cost comparisons reveal that OHOT projects are more economical than CTB projects when compared to the capital expenditure and subsequent maintenance obligation placed on the ULB's. When measured against CTB projects OHOT projects:
(1) have a lower life-cycle costs per seat, because there is no maintenance commitment required from the ULB
(2) provide a higher quality sanitation service
(3) are more convenient for the beneficiary family
(4) are a safer defecation arrangement
(5) are more impactful.

The Ministry of Urban Development's National Urban Sanitation Policy states that the “provision of individual toilets should be prioritised” but, with the lack of accurate data, ULBs are unable to apply the objectives of the policy to their city's sanitation planning policy document and formulate impactful projects. The temptation to default to CTB options is understandable but SA would encourage ULBs and other sanitation providers to use the toolkit to prepare projects which achieve tangible and long lasting change, to uplift some of India's most vulnerable citizens; after all unsanitary arrangements for defecating is not an indicator of poverty but a significant contributing factor.

shelter associates

A/17, Sarasnagar Siddhivinayak Society, Opposite Nehru Stadium, Shukrawar Peth,Pune - 411002
Telephone : 020 24440363 info@shelter-associates.org www.shelter-associates.org

Designed and Illustrated at
DesignDirections Pvt. Ltd.
www.designdirections.net