

seat used by 3-4 households which are known to each other. Operation and maintenance of community level shared toilets rests with designated 3-4 households. ULBs should encourage pooled OSS among such shared community toilets located at viable distances.

This section covers construction of community level shared toilets and conversion of any existing insanitary community level shared latrines to sanitary latrines.

1.2.1. Planning of community level shared toilets

ULBs should provide community level shared toilet in case individual toilets are not possible due to space constraints. These can be provided for urban households residing in slums, slum-like areas, authorised/ un-authorised colonies and urban villages (*gamtals*) and who either do not have an individual toilet or have an insanitary toilet.

All shared toilet will have either an underground sewer connection or an OSS (preferably pooled OSS), irrespective of the tenure status of the land on which such households are situated. Community level shared toilets may be provided in a cluster of upto 3-4 seats. Each seat will be provided to designated 3-4 households known to each other, who would maintain the toilet.

1.2.2 Design principles for community level shared toilets

Community level shared toilets should be constructed in a cluster of 3-4 toilet seats with either a back-to-back or side-to-side layout. All community level shared toilets will also have at least one bathing unit and a common washbasin. Community level shared toilets should also have overhead water storage for running water supply in toilets, bathing unit and washbasin.

1.2.3 Maintenance of community level shared toilets

Beneficiaries are responsible for maintenance of their respective community level shared toilets and OSS, if applicable. ULBs are responsible for operation and maintenance of sewerage system. All operation and maintenance parameters remain the same as defined in section 1.1.2 and will apply here.

1.2.4 Funding for community level shared toilets

MGSM funding for community level shared toilets is applicable only in exceptional cases where individual toilets are not possible due to space constraints. A maximum assistance of INR 30,000/- or actual cost, whichever is less is available for construction of a new community level shared toilet. Govt will fund 40 percent as viability gap funding (VGF) for such seat and MGSM will fund the remaining 60 percent. The ownership of such community level shared toilets will remain with the concerned authorities. However, user and operations & maintenance rights will be given to the beneficiary families.

1.2.5 Operationalizing construction of community level shared toilets

ULBs should carry out a survey and create awareness on the scheme to identify areas where community level shared toilets will be provided.

Based on the surveys and baseline data, ULBs will assess whether the community level shared toilet requires a connection to an existing sewerage system (wherever available) or construction of an on-site treatment unit. In case of on-site treatment unit, recommend technically appropriate options 'Various onsite technology options'.

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1.2.6 Pooled infrastructure and community mobilisation

Pooled infrastructure and community mobilisation section remains the same as 1.1.5.

1.3 Strategies for community toilets

MGSM will provide financial assistance to ULBs for repair and retrofitting of existing community toilets until provision of individual or community level shared toilets in the identified areas. This would include conversion of insanitary community toilets to sanitary community toilets as well. MGSM will provide a maximum support of INR 15,000/- per community toilet seat or actual costs, whichever is less, of which 40% i.e. INR 6,000/- may be provided by GOI.

1.4 Strategies for public toilets in public spaces (free/ pay & use)

All Urban Local Bodies (ULBs) should ensure adequate public toilets in all public places that attract floating population including but not limited to gardens, play grounds, exhibition grounds, *chowks*, markets, transit nodes, streets, highways with appropriate gender considerations (number of seats, design and operations). Based on guidelines of the Swachh Bharat Mission, floating population is assumed at 5 percent of the total urban population.

1.4.2 Implementation strategies and funding pattern

ULBs and other concerned departments should converge funds available under MGSM, other Central Government Grants, Corporate Social Responsibility (CSR), contributions from NGOs etc. ULBs should identify land for public toilets, leverage this land and advertisements and other rights to encourage the private sector to construct and manage to encourage the private sector to construct and manage public toilets through a PPP agreement as a preferred mode. ULBs could also mobilise additional revenues by use of roof tops etc.

Wherever possibility of engaging PPP mode for construction of public toilets is not adequate, maximum assistance for repair of public toilets to the extent of INR 25,000/- per seat and for construction to the extent of INR 50,000/- per seat or actual cost, whichever is less will be provided to the concerned ULBs/ authorities.

1.4.3 Adequacy and planning

ULBs and concerned departments should undertake micro-planning exercise to locate new public toilets or relocate existing public toilets. Public toilets should be located at each major transit node where there is a heavy footfall and near identified permanent markets/ *haats*. Mobile toilets should be provided near weekly/ seasonal markets/ *haats* and at sites where festivities/ rallies/ celebrations occur.

There should be way-finding signage to direct users to public toilets. ULBs and all concerned departments need to provide users with clear directions as to the location of the toilet and where it is not obvious, the distance to the toilet. The signage should be integrated with the existing signage put up by the city/ village for directions and transit nodes.

The operating hours for each public toilet should be based on the field requirements. For example, a public toilet near a commercial street should be open for minimum twelve hours while one near an inter-city bus station or railway station should be open for 24 hours.

All ULBs and concerned departments should ensure provision of temporary toilets for construction labour at all sites where they are undertaking construction or maintenance works.

Such clauses should also be reflected in contracts if these construction/maintenance works have been outsourced. The role of monitoring for provision of such temporary toilets under such contracts should be done by these agencies.

All ULBs should maintain a proper and updated database of public toilets with maps and should make it public. A map showing all public toilets with other details of toilet facilities such as opening hours, operating agency, user charges, toilet cleaning schedule, accessibility for people with disabilities and the details of other nearby toilets should be made available online as well as displayed at prominent public spaces.

Feasible and proven technological options for waste to energy measures and reuse and recycling of treated waste water locally for flushing and/ or gardening should be adopted in public toilets.

1.4.4 Design principles

ULBs should strictly adopt applicable toilet design norms and standards. Good design will typically include considerations for gender specific needs, block layout configurations, use of materials, adequate day-lighting, good natural ventilation, child-friendly and disabled-friendly provisions and good signage.

A typical toilet block should ideally include the following and may be adapted based on contextual requirements

- Men's toilet with one urinal, one water closet and a wash basin
- Women's toilet with two water closets and a wash basin
- One common child friendly water closet and a wash basin
- One common disabled friendly water closet and a wash basin

All toilets must have running water supply and safe disposal of waste water (either UGD or OSS). All facilities that have OSS should be cleaned as per the regime and procedures of the Advisory Note on Septage Management prepared by the Ministry of Urban Development, Government of India. In addition to the advisory, the guidelines on design and construction of septic tanks issued by the Bureau of Indian Standards and the Central Public Health and Environmental Engineering Organization (CPHEEO) and draft guidelines of the Swachh Bharat Mission are also a good reference on technical design and maintenance of septic tanks.

While designing public toilets, following good design principles should be followed:

Exhibit 4 Design principles for public toilets

		Must	Desirable
Access to the facility			
Approach	Approach to the facility should be through a paved road or footpath and should be clear of any obstructions	✓	
Parking space	Adequate parking space to be provided especially in facilities located near taxi/ auto stands, public places and major roads		✓
Access for disabled	Design guidelines for disabled-friendly toilets should be followed	✓	
Building Exterior			

		Must	Desirable
Lighting	Immediate surroundings of the facility should be adequately lit during the night	✓	
	Energy saving measures and use of solar lighting should be explored. Use of energy efficient lighting such as LED lights should be explored.		✓
	Colour of the exterior walls of the toilet blocks should be consistent across the city.	✓	
Signage about facility information and charges	Facilities should be easily visible through design, colour and appropriate signage	✓	
	Signboard showing names of O&M agencies, user charges, male-female sections, timings, directions should be placed at the entrance of the toilet and be clearly visible	✓	
Toilet Interiors			
General layout & Arrangement	After a common entrance to the public toilet, there should be separate entries to men's and women's sections	✓	
Signage	Signage with clearly written and appropriate symbols denoting the separate sections for men and women and physically disabled should be displayed	✓	
	Each cubicle should have instructions for proper use of facility behind the door	✓	
	Messages for hand washing after using the toilets should be displayed on the walls near the washbasins	✓	
	The design and colour of signage should be constant across all public toilets in a city	✓	
Internal walls, ceiling and floors	Flooring of the facility should be anti-skid and designed with appropriate slope to avoid water stagnation	✓	
	Light coloured tiled walls are easy to clean, reflect light and offer a sense of space.		✓
Doors, windows & ventilators for cubicles	There should be adequate day-light and ventilation in the facility	✓	
	Doors, windows and ventilators should be designed to provide privacy	✓	
	Door should open outside the cubicles	✓	
	Latches on the doors of the buildings should be at a height that could be accessed by a child	✓	
	Should allow maximum daylight inside the toilet blocks.		✓
Roof Lighting arrangement	Skylights and other passive design features to maximise daylight should be incorporated		✓
	Energy-efficient lighting should be explored and installed		✓
Infrastructure			

		Must	Desirable
Water supply	Running water should be made available in all toilet and bathing cubicles	✓	
Water storage facility	All facilities should have adequate underground and /or overhead storage. Water storage should be cleaned at least once a month.	✓	
Waste Water disposal	All facilities should have waste-water disposal either in municipal sewer line or OSS constructed as per the CPHEEO norms	✓	
Waste bins	Appropriate number of waste bins should be placed in cubicles as well as common areas, especially near wash basins	✓	
	A waste bin should be placed in each cubicle in the women's section	✓	
	Women sections could include feasible and proven technologies for incineration of sanitary pads		✓
Storage	A separate storage cabinet/ janitor's room for storing all cleaning equipment should be provided.	✓	
Vending	Sanitary pads vending machines in women's section		✓
Sanitary & Plumbing fixtures			
Urinals and Water Closets	Urinals <ul style="list-style-type: none"> ▪ All Urinals should be fitted with a flush valve and a flushing device, unless waterless urinals with proven effectiveness are installed in the facility ▪ Urinals should be separated by modesty boards ▪ Urinals should have a drain pipe below to avoid splashes ▪ If two or more urinals are installed, one should be installed at child's height. 	✓	
	Water Closets <ul style="list-style-type: none"> ▪ Each public toilets should have a combination of Indian or western seats 	✓	
	<ul style="list-style-type: none"> ▪ All WCs should have a flush valve 	✓	
	<ul style="list-style-type: none"> ▪ Automatic flushing devices could be explored. 		✓
	<ul style="list-style-type: none"> ▪ An ablution tap should be installed in all cubicles. ▪ A floor trap should be provided within the cubicle with western seat ▪ The flooring of the cubicle should be properly graded towards the floor trap or the Indian seat so as to keep the floor dry ▪ Hooks should be affixed behind cubicle doors ▪ One water closet in each male and female section should be child friendly 	✓	
Wash basin, Taps,	The water pressure and tap/wash basin position should not cause water to splash onto user's body during activation	✓	
	Where there are 2 or more basins, one should be installed at child's height.	✓	

		Must	Desirable
	All wash basins should have soap dispensers or soap dishes for hand washing	✓	
	Water saving taps, dual flush knobs (half flush and full flush knobs) and motion sensor taps could be explored for water conservation.		✓
Special Needs	Diaper changing station in the women's section	✓	
	Toilets for handicapped should be designed and constructed in accordance with Barrier Free and Accessibility Handbook published by CPWD ⁴ .	✓	
Mirrors	Separate mirrors should be provided for male and female sections		✓
Electricals			
Electricity connection & meter	All facilities should have a separate metered electricity connection		✓
	Electricity meters should be placed so that it is not prone to vandalism		✓
Switch boards	Switch boards should be installed at heights so that it could be comfortably reached by users	✓	

The above recommendations are based on a study of public conveniences in Ahmedabad. These recommendations may be suitably adapted to suit the local requirements.

1.4.5 Operations and maintenance

All ULBs should adopt model standard operating procedures (SOP) including cleanliness benchmarks for operation and maintenances of public toilets. Benchmarks should be made available to the public so that citizens are aware of the expected level of cleanliness. Model SOPs are annexed to the GR. The model SOP will have detailed guidelines for the general maintenance of the toilets including daily cleaning and maintaining physical infrastructure.

The general guidelines of the SOP include regular cleaning of toilets, urinals, floors, walls and ceilings of the interior as well as exterior of the facility. Periodic physical infrastructure maintenance schedule includes sanitary, plumbing, electrical and civil fixtures mostly maintained by engineering departments of respective ULBs.

ULBs may operate and maintain public toilets themselves or may outsource to private agencies. If outsourced, contracts of the agencies should be for duration of atleast 5 years. Payment to the contractors should be based on their performance (as per the benchmarks set by each ULB) and contractor's adherence to the SOP.

All ULBs should set up a monitoring plan for maintenance and cleanliness of public toilets. In addition to monitoring by ULBs, citizens' feedback through complaints registration should be used to track performance of private agencies contracted for operation, and maintenance of toilets. Payments of private operators should be linked to this performance measurement. All public toilets should either have one of the following systems for grievances recording and ensuring timely redressal.

- clearly displayed phone numbers of the toilet management
- a manual register for registering complaints
- On-line grievance registration & redressal

⁴(CPWD, 2014)

1.5 Strategies for temporary toilets at construction sites, special events and for homeless in urban areas

Strategies for temporary toilets at construction sites for construction labour and for special events such as exhibitions /fairs/special events etc. and for migrants and homeless in urban areas

The Government " Building and Other Construction workers Act 1996" gives focus on the working conditions of the labourers and their basic requirements. The term "building and construction Work" , includes, construction, alteration, repairs, maintenance or demolition, of or, in relation to, buildings, streets, roads, railways, tramways, airfields, irrigation, drainage, embankment and navigation works, flood control works (including storm water drainage works), generation, transmission and distribution of power, water works (including channels for distribution of water), oil and gas installations, electric lines, wireless, radio, television, telephone, telegraph and overseas communications, dams, canals, reservoirs, watercourses, tunnels, bridges, viaducts, aqueducts, pipelines, towers, cooling towers, transmission towers and such other work.

All ULBs should ensure that there are adequate number of temporary toilets constructed at all construction sites where

- the ULB is undertaking any construction
- Construction is being undertaken by other government organisation, private or non-government organisation within its jurisdiction. The ULB should monitor provision of such toilets as part of the building plan permission process.

All temporary accommodation (such as night shelters)for migrants and the homeless should have adequate provision for toilets either on the premises or have access to a public toilet nearby.

1.6 Strategy for government departments of the state

Adequate number of seats for all residents/ occupants as well as visitors to a government building is vital. Relevant Indian Standard (IS) Codes and other applicable benchmarks for provision on facilities such as toilet seats, urinals, and wash basins should be followed as indicated in the "guideline for Sanitation Index". Toilets should comply with regulations for provision of facilities for disabled persons and children. Adequacy is to be checked for current usage and density even if the building was designed as per earlier standards.

1. All government departments should ensure adequate toilets for all occupants and visitors. These are applicable for all buildings/ premises owned or occupied by the 'eligible organisations' – any organisation/ board/ corporation/ company of the Government of Gujarat as well as all buildings/ premises commissioned by eligible organisations on public private partnership (PPP).
2. Over and above these recommended standards, provisions for child-friendly as per the technical note containing norms and options for school and *anganwadi* toilet designs published by the Ministry of Rural Development⁵ have to be adhered to. Similarly, provisions should be made for the disabled in each toilet block as per the "Barrier Free Built Environment Guidelines" by the Central Public Works Department⁶.
3. Any labour/ construction workers engaged by any government body, either directly or through private contractors, shall be provided individual toilets at their residences and

⁵(Department of Drinking Water Supply, 2004)

⁶(Central Public Works Department, 1998)

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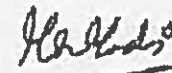
toilets at their workplace as per the Building and Other Construction Workers' Act 1996⁷.

All government departments should allocate required budget for providing adequate toilets within their premises and its upkeep.

Operations and Maintenance of toilets

All government departments should adopt model standard operating procedure (SOP) including cleanliness-benchmarks for operation and maintenances of toilets. Toilets could be operated and maintained by the concerned government departments or could be outsourced to private agencies. If outsourced, then the SOPs and benchmarks should be included in the contracts.

By order and in the name of the Governor of Gujarat.



(Manish Modi)
Under Secretary

Urban Development and Urban Housing Department

Encles. :

1. Annexure I – Guidelines for adopting supporting measures.
2. Annexure II – Various technology options for toilets.
3. Annexure III – Technological options for onsite sanitation systems under Swachh Bharat Mission.
5. Annexure IV- Draft IEC messages for toilet usages.
6. Annexure V – Standard operating procedures for cleaning of toilets.
7. Annexure VI - Standard operating procedures for faecal sludge management
8. Glossary
9. List of abbreviations.
10. Bibliography.

⁷(Chief Labour Commissioner, 1996)

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To,

Principal Secretary to Hon'ble Governor of Gujarat

Principal Secretary to Hon'ble Chief Minister,

All Personal Secretaries to Hon'ble Ministers / Hon'ble Ministers of State

/ Hon'ble Parliament Secretaries,

All A.C.S./ P.S./ Secretaries of the Secretariat Departments,

All HODs,

All Board Corporations,

All Collectors,

All DDOs,

All Municipal Commissioners,

Director of Municipalities, Gujarat State Gandhinagar,

Managing Director, GUDC, Gandhinagar,

Additional Chief Executive Officer, GUDM, Gandhinagar,

Chief Executive Officer, GMFB, Gandhinagar,

All Chief Officers (Through DOM),

Select file.

Annexure 1: Guidelines for adopting supporting measures

Annexure 1A: Regulatory framework: fines and public health bye-laws

Along with infrastructure creation and efficient operations, there is a need to put in place an adequate legislative framework which empowers ULBs to ensure strict enforcement of SWM rules & regulations and other sanitation guidelines.

GoG is preparing model public health bye-laws. All ULBs should adapt the model public health bye-laws for regulating all matters related to sanitation. The bye-laws will be applicable to every public and private space, commercial centres, residences and all public areas within the ULB limits. The bye-laws should spell out obligatory responsibilities of ULBs and penalties for the contravention of the bye-laws. Typically, Public Health Byelaws should include detailed regulations on:

- Classification of solid and liquid waste into different categories, waste generators
- Segregation, storage, collection, processing and disposal of solid and liquid waste
- Liquid Waste Management
- Prevention of Waterborne, Vector borne and Food borne diseases
- Offences under the bye-laws
- General offenses which is applicable to all the citizens within city limit
- Enforcement of the provisions
- Schedule of Fines

Annexure 1B: Effect behaviour change regarding health and hygiene

A key strategy to ensure that toilets are used and that cities become free of open defecation is to change behaviour of users and to generate awareness on the linkages of sanitation and health.

All urban local bodies should conduct information, education and communication (IEC) campaign on WASH (water, sanitation for health).

A good communication strategy should at a minimum include:

- Importance of using a toilet for the family and for the community at large
- hand washing with soap after defecation and before having food
- importance of cleanliness and hygiene, solid waste management

The IEC strategy should clearly define the target audience, content of the information, methods to be used to convey the information and approaches to promote action for change. IEC can be achieved through advocacy, interpersonal communication and community mobilisation with multi-media support including mass media, digital media and social media. Clear actionable messages should be designed to reach out to the target audience and should be in sync with the State Action Plan for IEC. Some sample draft messages for IEC related to use of toilets has been provided in **Error! Reference source not found.**

ULBs should converge such communication with other ongoing programs and outreach activities being undertaken.

ULBs should nominate relevant officials for training programs that will be conducted at the state level.

Annexure 1C: Eradicating manual scavenging practices

On September 18, 2013, 'The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013', of the Parliament referred to The Act hereon, received assent from the President of India. The act was prepared to provide for prohibition of employment as manual scavengers, rehabilitation of manual scavengers and their families and for matters connected there with of incidental thereto. The act recognises that

"... The dehumanising practice of manual scavenging arising from the continuing existence of insanitary latrines and a highly iniquitous caste system still persists in various parts of the country, and the existing laws have not proved adequate in eliminating the twin evils of insanitary latrines and manual scavenging."

(Ministry of Law and Justice, 2013, p. 1)

In ULBs, incidences of the manual scavenging may occur in any of the following instances:

- manual clearing of waste from insanitary latrines,
- manual cleaning of open defecation spots,
- manual cleaning of sewer lines,
- manual cleaning of septic tanks, and
- manual cleaning of railway tracks. While cleaning of railway tracks is done by the Indian Railway, all other locations of manual scavenging come under the municipal purview.

All ULBs should initiate activities as prescribed by, 'The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013'.

Annexure 1D: Monitoring under the Mahatma Gandhi Swachhata Mission

In order to promote the tenets of "sanitation" across the state, the Government of Gujarat has initiated a regular monitoring system for all departments of the state. MGSM will monitor sanitation in the state including government owned buildings, and initiatives in cities and villages. Refer Sanitation Index guidelines by Urban Development and Urban Housing Department, GoG which detail the monitoring framework.

The results of the sanitation index will be placed in public domain for enhanced citizen participation and to create a demand for improved sanitation facilities.

All ULBs should establish monitoring systems to report PAS / SLB indicators, systems for reporting OD free status.

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Annexure 2: Various technology options for toilets

The following technological options of OSS are recommended under Swachh Bharat Mission (SM) Urban for construction of Individual Household latrines (IHL)/ household toilets, group/shared latrines and community and public toilets

S. No.	OSS option	Application			
		IHL	Shared Latrine	Public Toilets	
1.	Twin-pit latrines / Leach Pits	✓			<ul style="list-style-type: none"> In low- to medium-density areas, particularly peri-urban areas, where there is space to install pits and where the digested sludge can be applied to local fields and/or gardens as a fertilizer and soil conditioner Where water use is in the range 30– 50 litres per capita per day depending upon the characteristics of the soil or groundwater level.
2.	Septic Tank System with soak pit	✓	✓	✓	<ul style="list-style-type: none"> Septic tanks are widely used to provide partial treatment of wastewater from individual homes, household clusters or institutional buildings where there is no sewerage network. For soak pits to function, soil conditions must be suitable for infiltration of effluent from septic tanks
3.	Bio-digester toilets (Anaerobic developed by DRDO)	✓	✓	✓	<ul style="list-style-type: none"> Widely used to provide 80% treatment of wastewater from IHL, household clusters or institutional buildings where there is no sewerage network. The effluent should be passed through a reed bed or soak pit before discharge. For soak pits to function, soil conditions must be suitable for infiltration of effluent from septic tanks
4.	Aerobic Bio Tank	✓	✓	✓	<ul style="list-style-type: none"> Widely used to provide 100% treatment of wastewater from IHL, clusters of houses or institutional building where there is no sewerage network. The effluent can be directly discharged since it is completely safe; Chlorination needs to be followed after treatment

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Annexure 3: Technological options for on-site sanitation systems under Swachh Bharat Mission

This note explains the technical options for On-Site Sanitation (OSS) that are recommended under the Swachh Bharat Mission (SBM).

Features of On-Site Sanitation (OSS) Systems:

When sewage is collected, treated and/or disposed off at, or near the point of generation, without the use of an underground sewerage system, the system is called "on-site sanitation" (OSS) system. OSS systems are sanitation facilities provided for the use of individual households, community and the floating population. There are a number of situations when an underground sewerage system may not be feasible or desirable. For example, for smaller cities where construction of sewerage infrastructure may be expensive, or those cities that are in hilly areas or in undulating terrain where it may not be practical to construct a sewer network, or even in many cities that have grown organically and where not all households are connected to the existing sewerage network.

OSS systems consist of two main structures, the toilet (superstructure, including the pan and water closet) and the treatment unit. OSS retains waste in the vicinity of the toilet either in a pit, tank or vault. The treatment ranges from a basic sanitary facility such as twin-pit latrines, to a simple type of treatment system by combining a septic tank and a soak pit, or a bio-digester toilet (aerobic and anaerobic).

OSS technology options recommended under SBM:

The following technological options for OSS are recommended under Swachh Bharat Mission (SBM) for construction of Individual Household Latrines (IHL), group / shared latrines, and community and public toilets:

S. No.	OSS Option	Kind of Latrines				Application
		IHL	Shared Latrines/ Group Toilets	Community Toilets	Public Toilets	
1	Twin-pit latrines / Leach Pits					<ul style="list-style-type: none"> • in low- to medium-density areas, particularly peri-urban areas, where there is space to install pits and where the digested sludge can be applied to local fields and/or gardens as a fertilizer and soil conditioner. • Where water use is in the range 20-50 liters per capita per day depending upon the characteristics of the soil or groundwater level.
2	Septic Tank System with soak pit					<ul style="list-style-type: none"> • Septic tanks are widely used to provide partial treatment of wastewater from individual homes, household clusters or institutional buildings where there is no sewerage network.

S. No.	OSS Option	Kind of Latrines			Application	
		IHL	Shared Latrines/ Group Toilets	Community Toilets		Public Toilets
					<ul style="list-style-type: none"> For soak pits to function, soil conditions must be suitable for infiltration of effluent from septic tanks 	
3.	Bio-digester toilet (Anaerobic - developed by DRDO)	0	0	0	0	<ul style="list-style-type: none"> Claims to provide 80% treatment of wastewater from IHL, household clusters or institutional buildings where there is no sewerage network. The effluent should be passed through a reed bed or soak pit before discharge. For soak pits to function, soil conditions must be suitable for infiltration of effluent from septic tanks
4.	Aerobic BioTank	0	0	0	0	<ul style="list-style-type: none"> It claims to provide 100% treatment of wastewater from IHL, clusters of houses or institutional building where there is no sewerage networks. It claims that the effluent can be directly discharged since it is completely safe. Chlorination needs to be followed after treatment

OSS vs. underground sewerage. Wherever a sewerage system is feasible within 30m from the proposed individual household, community or public toilets, only the superstructure (i.e. toilets) may be constructed under SBM and connected to the existing sewerage system. No construction of treatment units such as twin pit, septic tank, bio-digester or bio-tank shall be allowed.

Technical features & specification for OSS Options under SBM

The details of technical features and specifications are given as under. The costs are simply estimates at this point of time and should be verified at the time of selection and installation of the technology.

1. Twin Pit Latrine

<p>Description.</p>	<p>It consists of superstructure (Toilet) and treatment units (two chambers). The two underground chambers (pits) are provided to hold fecal sludge. These are normally offset from the toilet and should be at least 1 meter apart. A single pipe leads from the toilet to a small diversion chamber, from which separate pipes lead to the two underground chambers. The pits should be lined with open-jointed brickwork. Each pit should be designed to hold at least 12 months accumulation of fecal sludge.</p> <p>Wastewater is discharged to one chamber until it is full of fecal sludge. Discharge is then switched to the second chamber. Just before the second chamber is full of fecal sludge, the contents of the first pit are dug out. During the time of storage, digestion should ensure that it is odorless and free of pathogens.</p>
<p>O&M Requirements</p>	<p>The pits must be used alternately and the diversion chamber must be accessible so that flow can be diverted between chambers. Wastewater should never be diverted back to the first chamber before digested sludge has been removed from it.</p> <p>Responsibility for O&M of the twin-pit latrine rests primarily with the householder, who needs to ensure that the pits are used in the correct sequence and are emptied at the appropriate time. However, ULB utility or private contractors are required for emptying and to ensure safe disposal of sludge at a treatment plant.</p>
<p>Additional Infrastructure / treatment requirements</p>	<p>If digested material cannot be used in local fields and gardens, provision will have to be made for transportation to areas outside the city for reuse on agricultural land.</p>
<p>Limitations</p>	<ul style="list-style-type: none"> • Households may not understand the system and as a result may not use the pits alternately, or may omit to rest the filled pit at least for one year so that the contents degrade and become harmless. • Explanation of the operation and maintenance requirements is therefore essential at the time of installation. • Water may percolate through the soil surrounding the pit and pollute groundwater, which is a potential problem if water is used for drinking.
<p>Specifications</p>	<p>(a) Size options for Toilet/ Super Structure (as shown in Fig. 1): Any one of the sizes given below may be adopted depending upon the space availability and affordability of the individual.</p> <ul style="list-style-type: none"> a. 750 mm x 900 mm x 1900mm; or b. 800 mm x 1000 mm x 1900 mm; c. 900 mm x 1050 mm x 1900 mm <p>(b) Material – Brick work (as per Fig. 1) / FRP/ Pre-cast Cylindrical Unit</p>

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	<p>(c) Minimum Land Requirement – 40 Sq. ft. -60 Sq. ft. (depending upon the location of superstructure and distance between two pits)</p> <p>(d) Size of Pits is shown in Table -1 below</p> <table border="1"> <thead> <tr> <th></th> <th colspan="2">5 users^a</th> <th colspan="2">10 users^{aa}</th> <th colspan="2">15 users^{aaa}</th> </tr> <tr> <th></th> <th>Dia</th> <th>Depth (A)</th> <th>Dia</th> <th>Depth (A)</th> <th>Dia</th> <th>Depth (A)</th> </tr> </thead> <tbody> <tr> <td>Pit size</td> <td>900</td> <td>1000</td> <td>1100</td> <td>1300</td> <td>1300</td> <td>1400</td> </tr> </tbody> </table> <p>^a - only for IHL ^{aa} - Group household toilets The specification for pits given at Fig 2 may be referred to.</p>							5 users ^a		10 users ^{aa}		15 users ^{aaa}			Dia	Depth (A)	Dia	Depth (A)	Dia	Depth (A)	Pit size	900	1000	1100	1300	1300	1400
	5 users ^a		10 users ^{aa}		15 users ^{aaa}																						
	Dia	Depth (A)	Dia	Depth (A)	Dia	Depth (A)																					
Pit size	900	1000	1100	1300	1300	1400																					
Cost (for 5 users)	Tentative cost varies from Rs. 15,000/- to Rs. 20,000/- depending upon the construction material.																										

DESIGN OF PITS UNDER DIFFERENT CONDITIONS	
Normal conditions	<p>A typical pour flush latrine with circular pits for normal conditions is shown in Figure 2. In rocky strata with a soil layer in between, the leach pits can be designed on the same principle as those for low subsoil water level and taking the long-term infiltrative capacity as 20 l/m²/d. However, in rocks with fissures, chalk formations, or old root channels, pollution can flow for very long distances; hence these conditions demand careful investigation and adoption of adequate pollution safeguards. Pits in black cotton soil should be designed taking infiltrative rate of 10 l/m²/d.</p> <p>A vertical fill (envelope) of 300 mm in width with sand, gravel or ballast of small sizes should be provided all round the pit outside the pit lining in rocky strata with fissures and in black cotton soil.</p>
In water-logged areas	<p>The pit top should be raised by 300 mm above the likely level of water above ground level at the time of water logging. Earth should then be filled well compacted all-round the pits up to 1.0 m distance from the pit and up to its top. The raising of the pit will necessitate the raising of latrine floor also. A typical pour flush latrine in water-logged areas is shown in Figure 3.</p>
In high subsoil water level	<p>Where the subsoil water level rises to less than 300 mm below ground level, the top of the pits should be raised by 300 mm above the likely subsoil water level and earth should be filled all round the pits and latrine floor raised as stated above. A typical pour flush latrine with leach pits in high subsoil water level is shown in Figure 4.</p>
Where space is a constraint	<p>Where circular pits of standard sizes cannot be constructed due to space constraints, deeper pit with small diameter (not less than 750 mm), or combined oval, square or rectangular pits divided into two equal compartments by a partition wall may be provided. In case of combined pits and the partition wall should not have holes. The partition wall should go 225 mm deeper than the pit lining and plastered on both sides with cement mortar. A typical pour flush latrine with combined pits is shown in Figure 5.</p>

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II. Septic Tank

Description	A septic tank is a buried chamber that collects, stores and treats the wastewater under anaerobic conditions. Effluent from septic tanks should be discharged into a soak pit. A well-managed septic tank will remove about 50 to 60 % of the biological load in the wastewater.																											
Mode of operation	Solids settle in the tank and digest anaerobically. This reduces sludge volume and enables wastewater to infiltrate into the ground without clogging the leaching system. Sludge settles in the tank and digests anaerobically over time, releasing methane and other gases.																											
O&M Requirements	Septage must be removed from septic tanks at least once every 2 or 3 years and transported off-site for treatment prior to disposal. Municipal utility or private contractors are required for desludging of septic tanks and to ensure safe disposal of septage at a treatment plant. However the responsibility for O&M of the septic tank itself lies with the owner of the property.																											
Limitations	<ul style="list-style-type: none"> • Cost and space requirements for the soak pit. • Though septic tanks are designed for receiving black water, they often receive both black and grey water. As a result, the retention time in the septic tank is insufficient and the soak-pit becomes hydraulically overloaded. This means that the septic tanks need to be de-sludged regularly. 																											
Specifications	<p>(a) Size options for Toilet/ Super Structure (as shown in Fig.1) Any one of the sizes given below may be adopted depending upon the space availability and affordability of the individual.</p> <ul style="list-style-type: none"> a. 750 mm x 900 mm x 1900mm; or b. 800 mm x 1000 mm x 1900 mm; c. 900 mm x 1050 mm x 1900 mm <p>(a) Material – Brick work (as per Fig. 1) / FRP / Pre-cast Cylindrical Unit.</p> <p>(b) Minimum Land requirement - 40 Sq. ft. to 50 Sq. ft. (depending upon the location of superstructure)</p> <p>(c) Soak-pit size - The seepage pit may be of any suitable shape with the least cross-sectional dimension of 0.90 m and not less than 1 m in depth below the invert level of the inlet pipe. The construction shall be of perforated brickwork.</p> <p>(d) Recommended sizes of septic tanks for households (up to 20 Users – group / shared toilets) is given in Table 2 below.</p> <table border="1" data-bbox="597 1400 1360 1572"> <thead> <tr> <th rowspan="2">No. of users</th> <th rowspan="2">Length (m)</th> <th rowspan="2">Breadth (m)</th> <th colspan="2">Liquid depth (m) (Cleaning interval of)</th> </tr> <tr> <th>2 years</th> <th>3 years</th> </tr> </thead> <tbody> <tr> <td>5*</td> <td>1.5</td> <td>0.75</td> <td>1.0</td> <td>1.05</td> </tr> <tr> <td>10**</td> <td>2.0</td> <td>0.90</td> <td>1.0</td> <td>1.4</td> </tr> <tr> <td>15**</td> <td>2.0</td> <td>0.90</td> <td>1.3</td> <td>2.00</td> </tr> <tr> <td>20**</td> <td>2.3</td> <td>1.10</td> <td>1.3</td> <td>1.80</td> </tr> </tbody> </table> <p>* - only for IHL ** Shared/Group household toilets</p> <p>Note 1: The capacities are recommended on the assumption that discharge from only WC will be treated in the septic tank.</p>	No. of users	Length (m)	Breadth (m)	Liquid depth (m) (Cleaning interval of)		2 years	3 years	5*	1.5	0.75	1.0	1.05	10**	2.0	0.90	1.0	1.4	15**	2.0	0.90	1.3	2.00	20**	2.3	1.10	1.3	1.80
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20**	2.3	1.10	1.3	1.80																								

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	<p><i>Note 2: A provision of 300 mm should be made for free board.</i></p> <p><i>Note 3: The sizes of septic tank are based on certain assumption on peak discharge, as estimated in IS: 2470 (part 1) and while choosing the size of septic tank exact calculations shall be made.</i></p>
Cost (for 6 users)	<ul style="list-style-type: none"> Tentative cost varies from Rs. 25,000/- to Rs. 30,000/- depending upon the construction material (toilet and septic tank). Pre fabricated septic tanks are available at lower cost in the market, which also may be explored to speed up the implementation.

III Bio-digester Toilet (Developed by DRDO)

Description	<p>A bio-digester toilet is an anaerobic multi-compartment tank with inoculum (anaerobic bacteria) which digests organic material biologically. The details of bio-digester toilets are shown in Figure 7. This system converts faecal waste into usable water and gases in an eco-friendly manner.</p> <p>It can be connected to the toilet or a series of toilets. The toilet can be a superstructure fixed on the bio-digester tank or a separate unit. Bio-digester tank has an inlet, an outlet and a gas pipe.</p> <p>The tank has two components, namely, anaerobic microbial inoculum (seed bacteria) and specially designed fermentation tank. The tank can be made out of stainless steel, mild steel, FRP or concrete or brick and mortar.</p> <p>The effluent from bio-digester tank is needed to be further disposed into a soak pit or a reed bed arrangement for its treatment to acceptable levels for reuse.</p>
Advantages	<ul style="list-style-type: none"> It is claimed that there is no sludge formation, consequently there is no need for de-sludging and treatment and hence it is more economical in the long-term as it conserves water and has minimum O&M Night soil degradation occurs through microbial reaction which converts it into bio gas and odorless water. Technology is environmental friendly, maintenance free and efficient without depending on conventional energy sources. Permits use of toilet cleansing agents. Suitable for mobile and stationary platforms. Lifelong usage bio-digester tank does not need recharging, re-shifting or maintenance. Costs lesser than the conventional toilets. Easy to transport and install. One-third to one-fourth capacity of septic tank Space requirement is less.
Limitation	<ul style="list-style-type: none"> If the digester is not in use for more than 4-5 months continuously, a small portion of inoculum to be fed for reactivation of Bacteria.
Specifications	<p>Toilet Superstructure</p> <p>(a) Size options for Toilet/ Super Structure (as shown in Fig. 1). Any one of the sizes given below may be adopted depending upon the space availability and affordability of the individual.</p>

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	<p>a. 750 mm x 900 mm x 1900mm; or b. 800 mm x 1000 mm x 1900 mm ; c. 900 mm x 1050 mm x 1900 mm</p> <p>(b) Material-- Brick work (as per Fig. 1) /FRP /Pre cast Cylindrical or Square</p> <p>Bio tank</p> <p>(a) Land requirement a. 20-25 sq. ft. (superstructure above Bio Tank ,reedbed or soak pit) b. 9-10 sqft (superstructure above Bio Tank)</p> <p>(b) Tank internal dimensions -- 715 mm x1000 mm x 1000 mm</p> <p>(c) Diagonal partition wall of 2.5-3mm thickness (adequately stiffened by ribs)</p> <p>(d) Tank is buried 600mm deep and anchored by 300mm long stainless steel (SS316) anchor bolts at corners(Not required)</p> <p>(e) FRP tanks of average 3mm (2.5-6mm depending on the volume) thickness</p> <p>(f) Provision of water sealed outlet from the tank</p> <p>(g) For 5-6 users: a. Total capacity: 700 litres (1000 mm x 700 mm and 1000 mm depth). Where space is a constraint the depth of the tank can be increased to 1.5 m b. Volume of anaerobic Compartment (30% of capacity) 210 litres c. Tank may be constructed with masonry also.</p> <p>Table 3 - Volume of bio-digester tank for various user groups:</p> <table border="1"> <thead> <tr> <th>No. of users</th> <th>Size of bio-digester / bio-toilet</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>4-7 (Single family)</td> <td>0.7 m³ (FRP / RCC material/ Brick and Mortar/ precast)</td> <td>Individual</td> </tr> <tr> <td>8-15 (two families)</td> <td>1 m³ (FRP / RCC material/ Brick and Mortar/ precast)</td> <td>Group / shared</td> </tr> <tr> <td>30-50</td> <td>3 m³ (FRP / RCC material/ Brick and Mortar/ precast)</td> <td rowspan="4">Community</td> </tr> <tr> <td>100-120</td> <td>6.0 m³ (FRP / RCC material/ Brick and Mortar/ precast*)</td> </tr> <tr> <td>200-220</td> <td>10.0 m³ (RCC material/ Pre cast/Brick and Mortar/)</td> </tr> <tr> <td>500-600</td> <td>30.0 m³ (RCC material/ Pre cast/Brick and Mortar)</td> </tr> </tbody> </table> <p>* It is not recommended to use FRP tank for volume of more than 5-6.0 m³ as logistics will be difficult and transportation cost is high.</p>	No. of users	Size of bio-digester / bio-toilet	Remarks	4-7 (Single family)	0.7 m ³ (FRP / RCC material/ Brick and Mortar/ precast)	Individual	8-15 (two families)	1 m ³ (FRP / RCC material/ Brick and Mortar/ precast)	Group / shared	30-50	3 m ³ (FRP / RCC material/ Brick and Mortar/ precast)	Community	100-120	6.0 m ³ (FRP / RCC material/ Brick and Mortar/ precast*)	200-220	10.0 m ³ (RCC material/ Pre cast/Brick and Mortar/)	500-600	30.0 m ³ (RCC material/ Pre cast/Brick and Mortar)
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<p>Cost Estimates</p>	<ul style="list-style-type: none"> Toilet cost (super Structure)- between Rs. 15,000 and Rs. 20,000 depending on material of construction; Bio-digester tank Cost - as per Table 4 below <table border="1"> <thead> <tr> <th rowspan="2">Bio-digester tank-></th> <th colspan="3">Material of construction</th> </tr> <tr> <th>Masonry</th> <th>Precast Cylindrical Unit</th> <th>Fiber reinforced plastic</th> </tr> </thead> <tbody> <tr> <td>5 to 7 users (700 Litre)</td> <td>17,100</td> <td>13,000</td> <td>22,000</td> </tr> <tr> <td>10 to 12 users (1000 Litre)*</td> <td>19,000</td> <td>15,000</td> <td>24,000</td> </tr> </tbody> </table> <p>**Group / Shared toilets</p>	Bio-digester tank->	Material of construction			Masonry	Precast Cylindrical Unit	Fiber reinforced plastic	5 to 7 users (700 Litre)	17,100	13,000	22,000	10 to 12 users (1000 Litre)*	19,000	15,000	24,000			
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	<p>Notes on Bio-Digester-based Toilets</p> <p>1. Cost of construction will depend on the schedule rates of each state.</p> <p>2. The Claims made by Biodigester providers that 'No sludge shall be produced' consequent to 'waste water treatment by addition of certain patented inoculums and processes in the bio tank'. It has been stated that use of phenyl and other chemical toilet cleansing agents will not unduly affect treatment efficiency, have not been independently verified by CPHE EO/MoUD.</p> <p>As such, while drafting contracts, the firms/ ToT holders engaged to construct toilets using this technology should be held to be financially and legally responsible for tenability of their claims.</p>
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IV Aerobic Bio Tank/ Bio Toilets (Patented by a private operator and approved by Department of Science and Technology)®

Description	<p>This technology differs from that of the bio-digester toilets developed by DRDO since the process adopted is aerobic- which involves a different multi-strain of bacteria which breaks down the waste matter through oxidization. Bio-toilets consist of a purpose built multi-chambered bio-tank in which the waste is stored as shown in Figure 8. The movement of the waste is slowed down as the waste flows from one chamber to another by a special process in the Bio-tank such that the multi-strain bio-media present in the tank can digest the waste and convert it fully into non-toxic, neutral water. This water then passes through the last chamber for disinfection. Here water is treated with Chlorine where the majority of the germs are killed. The resultant water is free from all sorts of E-coli and fecal coliforms.</p> <p>The bricks and mortar Bio-tank is described in the last diagram of Figure 8. The superstructure is made of bricks and mortar. These are available in both flush and non-flush models.</p>
Advantages	<ul style="list-style-type: none"> • Aerobic bacteria are very efficient in breaking down organic waste and the waste is decomposed into water by the bacteria within 24 hours. The end products of aerobic degradation are carbon dioxide (CO₂) and water (H₂O). • The aerobic pathway also releases a substantial amount of energy. • The Bio-toilet is available in both, portable as well as fixed models. The advantage of the portable model is that it can be shifted from one location to another as and when required, and the module can be assembled and disassembled easily. • The Bio-toilet eliminates the need for any periodic sludge removal.
Limitations	<ul style="list-style-type: none"> • The bacteria functions best in temperatures between 4 and 55 degrees centigrade • Bio-toilets need proper bacteria inoculation periodically depending on the usage at particular sites. An in-depth understanding of the operation and use of toilets in a given area must be undertaken BEFORE choosing bio-toilets as a solution. • Attention must be given to O&M, especially in dense urban settlements where chances of blockage of bio-toilets increase, making it dysfunctional

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	<ul style="list-style-type: none"> over a period of time if the inoculation is not done in time. Phenyl/ Harpic or any strong detergent/acid and bleaching powder should not be used to clean the pan. Only herbal / ayurvedic cleaning agents should be used. Chlorine dose is necessary for disinfection.
O&M	Responsibility of cleaning the toilet / superstructure is with the owner of the household in the case of IHLs / shared latrines and with the ULB in the case of community / public toilets.
Specifications	<p>(e) Size options for Toilet/ Super Structure (as shown in Fig.1): Any one of the sizes given below may be adopted depending upon the space availability and affordability of the individual.</p> <ul style="list-style-type: none"> a. 750 mm x 900 mm x 1900mm; or b. 800 mm x 1000 mm x 1900 mm ; c. 900 mm x 1050 mm x 1900 mm <p>(a) Material – Bricks and Mortar walls of Bio Digester tank and Superstructure, PCC tank floor, RCC toilet floor, PVC Door and Frame, RCC/PVC/ISI sheet Toilet Roof.</p> <p>(b) The Bio-toilet system consists of:</p> <ul style="list-style-type: none"> Bio digester Tank(Bricks & Mortar/FRP/Steel), Superstructure(Bricks & Mortar/FRP) Indian Pan/VVC Size: 4 feet x 4 feet tank base, 4 feet tank height, 6 feet superstructure height. Maximum usage recommended: 30 defecations/ day/ bio-toilet (no limit on urination) <p>(c) Land requirement - 16 Sq. ft.</p>
Cost Estimates	The tentative cost of bio-toilet including super structure is approximately Rs.20,000/-depending upon material of construction. The bio-toilets should be supplied by the manufacturers, and the O&M for at least 5 years (including the feeding of inoculum in the periodicity needed) along with IEC (to train users for O&M) by the manufacturer / supplier also should be built into the undertaking.

Note:

The manufacturers of Aerobic Bio-tank/ Bio-Toilet have claimed that aerobic conditions shall be created in the bio-tank/ bio toilet solely through natural aeration and that no sludge production would take place. These claims have not been independently verified by the CRHEE O/MOUD. As such, while drafting contracts, the firms/ ToT holders engaged to construct toilets using this technology should be held to be financially and legally responsible for tenability of their claims.

They have also stated that inoculum shall have to be fed at least once in a quarter (3 months) for proper functioning of the treatment unit. It is also suggested to use herbal/ Ayurvedic cleaning agents as chemical agents such as phenyl may harm the inoculum. How and by whom shall the inoculum be administered and what are the consequent O&M charges due to these requirement is a function of remoteness of the toilet from major urban areas. The same may also be accounted for in the cost of toilet.

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Norms and Specifications for Community and Public Toilets

Description	<p>A community toilet block is a shared facility provided for a group of residents or an entire settlement. Community toilet blocks are used primarily in low-income informal settlements where space and/or land are constraints. Four flush option is generally used in this kind of OSS systems. It is also advisable to provide facilities like washing, bathing, and a small incinerator in this block for the use of the community</p> <p>Public toilets are provided for the floating population / general public in places such as markets, train stations or other public areas, where there is a considerable number of people passing by.</p>																																			
Septic tanks for public / community toilets	<p>Recommended sizes of septic tanks for community/ public toilets (up to 300 users) is given below in Table 5.</p> <table border="1" data-bbox="657 792 1388 994"> <thead> <tr> <th rowspan="2">No. of users</th> <th rowspan="2">Length (m)</th> <th rowspan="2">Breadth (m)</th> <th colspan="2">Liquid depth (cleaning interval of)</th> </tr> <tr> <th>2 years</th> <th>3 years</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>5.0</td> <td>2.00</td> <td>1.0</td> <td>1.24</td> </tr> <tr> <td>100</td> <td>7.5</td> <td>2.65</td> <td>1.0</td> <td>1.24</td> </tr> <tr> <td>150</td> <td>10.0</td> <td>3.00</td> <td>1.0</td> <td>1.24</td> </tr> <tr> <td>200</td> <td>12.0</td> <td>3.30</td> <td>1.0</td> <td>1.24</td> </tr> <tr> <td>300</td> <td>15.0</td> <td>4.00</td> <td>1.0</td> <td>1.24</td> </tr> </tbody> </table> <p>Source: Manual on Sewerage and Sewage Treatment Systems, 2013 Part A Engineering</p> <p>Note 1: A provision of 300 mm should be made for free board.</p> <p>Note 2: The sizes of septic tanks are based on certain assumptions on peak discharges, as estimated in IS: 2470 (Part 1) and while choosing the size of septic tank exact calculations shall be made.</p> <p>Note 3: For population over 100, the tank may be divided into independent parallel chambers of maintenance and cleaning</p>				No. of users	Length (m)	Breadth (m)	Liquid depth (cleaning interval of)		2 years	3 years	50	5.0	2.00	1.0	1.24	100	7.5	2.65	1.0	1.24	150	10.0	3.00	1.0	1.24	200	12.0	3.30	1.0	1.24	300	15.0	4.00	1.0	1.24
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Public Toilets - Norms for toilet seats	<p>Norms for toilet seats for public toilets are given in Table 6 below.</p> <table border="1" data-bbox="657 1330 1388 1653"> <thead> <tr> <th>S. No.</th> <th>Sanitary Unit</th> <th>For Male.</th> <th>For Female (*)</th> </tr> </thead> <tbody> <tr> <td>i.</td> <td>Water Closet</td> <td>One per 100 persons up to 400 persons; For over 400 persons, add at the rate of one per 250 persons or part thereof</td> <td>Two for 100 persons up to 200 persons; over 200 persons, add at the rate of one per 100 persons or part thereof</td> </tr> <tr> <td>ii.</td> <td>Ablution Taps</td> <td>One in each W.C.</td> <td>One in each W. C.</td> </tr> <tr> <td>iii.</td> <td>Urinals</td> <td>One for 50 persons or part thereof</td> <td>Nil</td> </tr> <tr> <td>iv.</td> <td>Wash basins</td> <td>One per W. C. and urinal provided</td> <td>One per W. C. provided</td> </tr> </tbody> </table> <p>Source: Manual on Sewerage and Sewage Treatment Systems, 2013 Part A Engineering</p>				S. No.	Sanitary Unit	For Male.	For Female (*)	i.	Water Closet	One per 100 persons up to 400 persons; For over 400 persons, add at the rate of one per 250 persons or part thereof	Two for 100 persons up to 200 persons; over 200 persons, add at the rate of one per 100 persons or part thereof	ii.	Ablution Taps	One in each W.C.	One in each W. C.	iii.	Urinals	One for 50 persons or part thereof	Nil	iv.	Wash basins	One per W. C. and urinal provided	One per W. C. provided												
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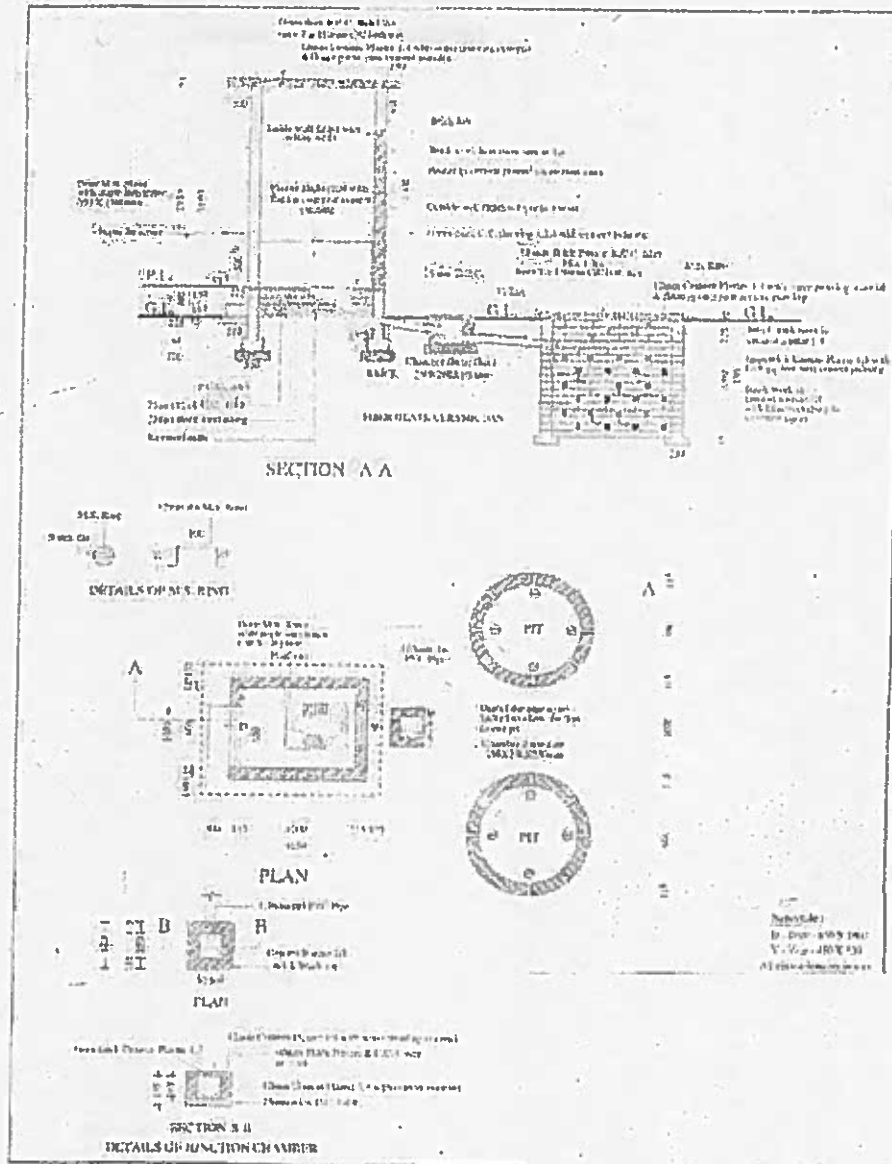
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	<p>Note:</p> <p>i) It may be assumed that two-thirds of the number are males and one-third females</p> <p>ii) One water tap with drainage arrangements shall be provided for every 50 persons or part thereof in the vicinity of water closet and urinals.</p> <p>* At least 50% of female WCs may be Indian pan and 50% EWC</p> <p>iii) Separate seat may also be provided for trans-genders</p> <p>iv) Special arrangements may be made for physically challenged.</p>																											
Treatment units	<ol style="list-style-type: none"> 1. Bio Digester with reed bed systems/soak pits 2. Aerobic Bio Tank 3. Septic Tank with Soak Pits 																											
Cost	<p>Tentative basic cost for community toilets is Rs. 55,000/- per seat and public toilets is Rs. 75,000/- per seat. However, the cost per seat would vary depending upon the construction material, quality of construction, type of treatment technology adopted and O&M for specified period etc. However the cost of toilet in bio-digester given by NBCC are as under.</p> <table border="1"> <tr> <td colspan="3">Superstructure 6 Cubicle for 200 users</td> </tr> <tr> <td>Pre Painted galvanized Sheets</td> <td>Masonry</td> <td>Cement Board</td> </tr> <tr> <td>Rs. 1,63,000.00/-</td> <td>Rs. 95,000.00/-</td> <td>Rs. 80,000.00/-</td> </tr> <tr> <td colspan="3">Superstructure 10 Cubicle for 400 users</td> </tr> <tr> <td>Pre Painted galvanized Sheets</td> <td>Masonry</td> <td>Cement Board</td> </tr> <tr> <td>Rs. 3,26,000.00/-</td> <td>Rs. 1,60,000.00/-</td> <td>Rs. 1,60,000.00/-</td> </tr> <tr> <td colspan="3">Bio Digester Tank 10 KLD for every 200 users</td> </tr> <tr> <td>Masonry</td> <td></td> <td></td> </tr> <tr> <td>Rs. 1,74,000.00/- per 200 user</td> <td></td> <td></td> </tr> </table>	Superstructure 6 Cubicle for 200 users			Pre Painted galvanized Sheets	Masonry	Cement Board	Rs. 1,63,000.00/-	Rs. 95,000.00/-	Rs. 80,000.00/-	Superstructure 10 Cubicle for 400 users			Pre Painted galvanized Sheets	Masonry	Cement Board	Rs. 3,26,000.00/-	Rs. 1,60,000.00/-	Rs. 1,60,000.00/-	Bio Digester Tank 10 KLD for every 200 users			Masonry			Rs. 1,74,000.00/- per 200 user		
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Additional Infrastructure	<p>It must be ensured that adequate water supply arrangement shall be made for proper functioning and upkeep of toilets. Wherever possible, ULBs should ensure that public and community toilets are outfitted with solar panels for the generation of electricity to ensure uninterrupted power supply and bring down O&M costs.</p>																											
Implementation Mode	<p>All toilets shall be constructed through PPP mode with inbuilt provision of O&M for at least a period of 5 years.</p>																											

For additional details, the guidelines developed by NBCC can be downloaded (www.nbccindia.gov.in)

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Figure 1: Detailed layout of toilet



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Figure 2: Pour-flush latrine with circular pits
 (Source: Manual on Sewerage and Sewage Treatment Systems, 2013, Part A: Engineering)

