

Operative Guidelines on Septage Management (Collection, Transportation, Treatment and Disposal) in Greater Warangal Municipal Corporation (GWMC)

Issued by

Municipal Commissioner, Greater Warangal Municipal Corporation

Date:

GWMC is mandated with the function of “public health, sanitation, conservancy and solid waste management” in accordance with the Constitutional Amendment Act, 1994. The Municipal Corporation Act has provided comprehensive powers to the Council and Commissioner for effective collection, transportation, treatment and disposal of sewage (the definition of which includes septage) within municipal jurisdiction. In addition national acts, policies, standards and guidelines as well as state sanitation strategies and building bye-laws on sewage and septage management need compliance at the municipal level. GWMC at present does not have sewerage system and depends on onsite sanitation. Due to inadequate attention in the past, the compliance with guidelines on septage management activities including collection, transportation, treatment and disposal is not effective. This has led to poor septage management and contributed to pollution of water bodies and environment.

The operative guidelines on septage management covering collection, transportation, treatment and disposal are issued by the Municipal Commissioner to ensure effective compliance with guidelines and standards at national and state level and achieve effective septage management.

The operative guidelines are applicable to households, operators and institutions engaged in septage management in GWMC. The GWMC will undertake awareness and dissemination campaigns on the operative guidelines to ensure better compliance by stakeholders.

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Glossary of Terms

ASCI:	Administrative Staff College of India
BIS:	Bureau of Indian Standards
CBO:	Community Based Organization
CDD:	Consortium for Development of DEWATS
CPHEEO:	Central Public Health Engineering and Environmental Organization
DEWATS:	Decentralized Waste Water Treatment System
DRDO:	Defense Research Development Organization
FSM:	Fecal Sludge Management
GPS:	Global Positioning System
GWMC:	Greater Warangal Municipal Corporation
IEC:	Information, Education and Communication
MIS:	Management Information System
MoUD:	Ministry of Urban Development
MSW:	Municipal Solid Waste
NBC:	National Building Code
NGO:	Non-government Organization
NIT:	National Institute of Technology
NUSP:	National Urban Sanitation Policy
O&M:	Operation and Maintenance
PPP:	Public Private Partnerships
STP:	Sewerage Treatment Plant
ULB:	Urban Local Body

1. Introduction

The Ministry of Urban Development (MoUD), Government of India has formulated “National Urban Sanitation Policy” in 2008 with the overall goal of transforming urban India into community driven, totally sanitized, healthy and livable cities and towns.

The NUSP recommended for safe collection, transportation and disposal of septage and installation of appropriate O&M systems for the upkeep of sanitation equipment.

The National Building Code 2005 brought out by the Bureau of Indian Standards (BIS) and the Manual on Sewerage and Sewage Treatment prepared by the CPHEEO constitute the major sources of standards and guidelines for septage management in India.

The National Building Code of India was prepared in 1970 to unify the building regulations throughout the country for use by government departments, municipal bodies and other construction agencies. The code was first revised in 1985 and a second revision took place in 2005 to incorporate the emerging good practices in building construction..

The Central Public Health and Environmental Engineering Organization (CPHEEO) of the Ministry of Urban Development has brought out a manual on sewerage and sewage treatment in 2012 which provided guidelines for septage management.

The CPHEEO Manual has assigned the responsibility of checking sludge accumulation on a daily basis and determining the time of emptying to the household.

The CPHEEO Manual has suggested that state and municipal governments should draw up an action plan for extracting, treating, and disposing of the sludge generated in on-site facilities in accordance with the “Septage Management Guidelines” (MOUD, 2013), and prepare measures and budgets necessary for implementation of the plan.

1.1. Need for Septage Management Guidelines at the City Level

The past experience across the country shows that the standards related to design of septic tanks and periodic desludging are not followed by households and urban local bodies over the years resulting in poor septage management.

The emptying and transportation of septage is not scientific and the treatment facilities for septage are not developed in cities leading to indiscriminate disposal of septage and pollution of water bodies.

It is in this context that the Ministry of Urban Development has brought out the Advisory Note on Septage Management in Urban India in 2013 to promote the need for integrated approach and guidelines for septage.

The MoUD Advisory Note recommended that the ULBs shall formulate their own bye laws and rules for management of septage in the city in consonance with municipal act in place covering the following.

- Design of septic tanks, pits etc. (adapted to local conditions) and methods of approval of building plans, or retro-fitting existing installations to comply with rules
- Special provisions for new real estate developments
- Periodicity of desludging, and O&M of installations
- Operating procedures for desludging including safety procedures
- Licensing and reporting
- Methods and locations of transport, treatment and disposal
- Tariffs or cess/tax etc. for septage management in the city
- Penalty clauses for untreated discharge for households as well as desludging agents
- Issuing licenses to private operators providing desludging services
- Adhering to safety norms as per CPHEEO manual on sewerage and sewage treatment 2012
- Conforming to the standards of the Environment Protection Act 1986
- Regular inspections of septic tanks and onsite systems by ULBs
- Collection of baseline data and record keeping

1.2. Current Status of Septage Management in Warangal

Warangal city with a population of 0.61 million as per 2011 census, is the second largest city in the newly formed state of Telangana, India. The city does not have sewerage system and depends only on on-site sanitation. About 77 percent of households have access to safe sanitation of which 59 percent have access to septic tanks and remaining 18 percent have access to pit toilets.

The septic tanks in the city don't have soak pits or trench pits in many cases. The out let of the septic tank is directly connected to open drains. Pit toilets comprise both single and twin pits. The desludging is done when the septic tank or pit is full or when there is a back flow, and not periodically as prescribed by the CPHEEO manual and the advisory note on septage management.

The desludging is done by private operators using desludging machines. The desludging workers are not equipped with safety gear such a gloves and masks. The fecal sludge collected from households is disposed in agricultural areas, drains and water bodies around the city. There is no effective monitoring process for fecal sludge management by the municipal officials due to lack of operative guidelines.

Hence there is a need for developing comprehensive septage management guidelines for the city and these operative guidelines are developed in response to this need.

2. Operative Guidelines for Septage Management in Warangal

These operative guidelines are framed by GWMC drawing from provisions and specifications related to septage management of the National Building Code, 2005, revised CPHEEO Manual

on Sewage and Sewerage Treatment 2012, Advisory Note on Septage Management in Urban India, 2013 and National Urban Sanitation Policy 2008.

The objective of these guidelines is to promote a comprehensive and integrated approach to septage management covering collection, storage, desludging, transportation, treatment, disposal and reuse and ensure compliance with various national level guidelines and regulations.

The guidelines cover the following key elements of septage management.

1. Design and construction of septic tanks
2. Conversion of insanitary latrines into sanitary latrines
3. Septic tank pumping and de-sludging
4. Septage transportation
5. Treatment, disposal and reuse of septage
6. Information, education and communication
7. Training programs
8. Record keeping and reporting (MIS)
9. Help line for septage management

The operative guidelines for each of these key elements are as follows.

2.1 Design and Construction of Septic Tanks

The households are encouraged to adopt the improved version of the designs of septic tanks as prescribed by the NBC code 2470 and CPHEEO manual. Households shall be encouraged to adopt three chamber septic tanks.

More advanced septic tanks and Decentralized Waste Water (DEWAT) systems shall be adopted by institutional and bulk consumers such as hotels, colleges and apartments.

The DRDO approved bio-digesters shall be encouraged at par with the septic tanks as these are cost effective and environment friendly. They also obviate the need for a soak pit.

GWMC shall adopt regulations on septic tank designs and construction methods as part of building plan regulations.

The town planning department of the municipal corporation shall ensure that the septic tank designs conform to the guidelines at the time of approval of building plan.

The town planning department shall inspect the septic tanks during their construction to ensure that there are no deviations from the approved design. The existing guidelines for septic tanks and suggested designs to be adopted by households are provided in Annexure 1.

2.2 Conversion of Insanitary Latrines into Sanitary Latrines

The public health department of the Corporation shall undertake a survey to identify the insanitary latrines and improperly constructed septic tanks.

All households with insanitary latrines shall be given notices to convert them into septic tanks and twin pits as per the provisions of the manual scavenging act 2013.

Households with improper septic tanks shall be educated to retrofit them as per the approved designs.

For slums and informal settlements twin pits may be permitted as per guidelines in Annexure 2.

2.3 Pumping and Desludging

The households, institutions, commercial entities etc., shall undertake desludging of the septic tanks and pits once in every three years or when they get filled-up whichever is earlier as per the NBC code and CPHEEO guidelines.

The operators shall obtain licenses for collection and transportation operations as per the formats provided in Annexures 3 and 4 these guidelines. The licenses shall be valid for a period of five years from the date of issue and shall be revised as per due process.

The households are required to engage the licensed operators for collection and transportation to desludge the septic tanks and pay the user charges as per the market rates. The GWMC reserves the right to fix the user charges in case the market rates are observed to be high and unaffordable to households.

The licensed operators shall have trained workers equipped with uniforms, safety gear, tools and vacuum trucks. The operator, drivers and workers shall have adequate training in septage desludging and transportation.

The licensed operators are required to adopt approved standards and procedures for pumping and desludging.

Desludging workers shall wear appropriate personal protective equipment, including rubber gloves, rubber boots, a face mask, and eye protection.

The operator shall ensure the availability of protective gear for workers and materials for cleaning on a daily basis.

After desludging, workers should follow proper hygiene practices such as washing hands with soap.

The workers should avoid entering into septic tank and it should be done in exceptional cases with proper care and safety equipment.

After each desludging operation, the area shall be properly cleaned and disinfected with relevant cleaning agents such as bleaching powder and lime.

2.4 Septage Transportation

Service providers shall deploy septage vehicles that meet the approved standards for desludging and transportation. The septage vehicles shall be fitted with Global Position System (GPS) and the details of GPS shall be shared with GWMC for monitoring purpose.

The driver and service providers shall be responsible for safe operation of the vehicle and equipment at all times and only drivers and workers with adequate training shall be deployed.

Transportation shall be undertaken on pre-designed routes avoiding busy roads and peak traffic.

In the event of accidental spillage of sludge/septage, the operator shall immediately take action to contain the sludge/septage, minimize the environmental impact, and begin clean-up procedures.

The operator shall notify the concerned officials about the spillage and the nature of remedial action within 24 hours. Penalties may be imposed on the operators who shall not comply with the guidelines.

2.5 Septage Treatment, Disposal and Reuse

The GWMC shall facilitate construction and operation of a septage treatment plant. An appropriate site for construction of septage treatment plant meeting environmental requirements and standards should be identified.

The operator of the septage treatment plant shall implement a comprehensive environmental management plan to ensure compliance with environmental and social standards.

The septage treatment plant shall adopt appropriate technology for treating septage and the disposed sludge and waste water after treatment shall strictly comply with the norms as per the relevant legislations.

It is the responsibility of the operator of the treatment plant to ensure the compliance with treatment and discharge norms. The reuse of treated waste shall be permitted as per the standards and norms.

It shall be mandatory for all licensed operators for collection and transportation of septage to dispose the septage only at the plant as per the approved process. The de-sludging service providers are prohibited to dispose the septage at any other location and would attract penalties for the same.

GWMC / operator of the septage treatment plant can levy charges for treatment and disposal of septage as per requirements.

The guidelines in this section shall become effective only after completion of the septage treatment plant. The GWMC reserves the right to suggest the septage disposal locations and the operators of collection and transportation shall comply with the same.

2.6 Information, Education and Communication (IEC)

The GWMC shall develop appropriate IEC materials and undertake IEC campaigns through print and electronic media, outdoor medium and consultations and workshops targeting the residents to promote adoption of proper toilet designs, construction methods, periodic desludging and safe sanitation practices.

The builders, masons and suppliers of the septic tanks and pits shall be exposed to better designs and better methods of construction.

The operators of collection and transportation shall be provided information on standard operating procedures.

Non-government Organization (NGOs), Community Based Organizations (CBOs), women's groups and school children shall be extensively involved in undertaking IEC campaigns.

2.7 Training Programs

GWMC shall support capacity building of various stakeholders including its own staff through appropriate institutions such as National Institute of Technology (NIT), Administrative Staff College (ASCI) and Consortium for Development of DEWATs (CDD).

GWMC shall engage these agencies to undertake training needs assessment, design training modules and deliver the training programs

2.8 Record keeping and MIS

GWMC shall create a computerized MIS platform for monitoring and evaluation (M&E) for baseline data and progress on implementation of septage management guidelines.

GWMC shall maintain data base and information related to septage generation from households and commercial establishments, insanitary latrines, location of septic tanks, details of operators responsible for collection of desludge and details of septage treatment plant.

GWMC shall ensure that the operators of collection and transportation and treatment of septage maintain detailed records of their operations covering households, area and location, type of septic tank, age of septic tank, date of desludging, quantity of septage, user charges collected, accidents and spillages and the next date of scheduling for desludging. A schedule for collection of information by operators is enclosed as Annexure 5.

2.9 Help Line for Septage Management

GWMC shall establish a dedicated help line with trained staff for providing support to residents on all aspects of septage management including septic tank designs, approval process, methods of construction, information on masons, periodicity of desludging, contact details of operators and so on.

Annexure 1: Septic Tank Specifications, Guidelines and Designs

Depending on the geography, soil condition, water seepage capacity of the soil the design can be prepared and approved by the Local Bodies. Proper septic tank design considers the following factors:

- Sized properly with appropriate sludge detention time, volume and hydraulic retention time
- Proper inlet and outlet structures
- At least one baffle separating the tank into multiple compartments
- Water tight
- Access port for each compartment that allows for inspection and pumping

Table 1: recommended Sizes of Septic Tanks as per Number of Users

Number of Users	Length (M)	Breadth (M)	Liquid Depth for a Cleaning Interval of 3 Years (M)
5	1.50	0.75	1.05
10	2.00	0.90	1.40
15	2.00	0.90	2.00
20	2.30	1.10	1.80
50	5.00	2.00	1.24
100	7.50	2.65	1.24
150	10.00	3.00	1.24
200	12.00	3.30	1.24
300	15.00	4.00	1.24

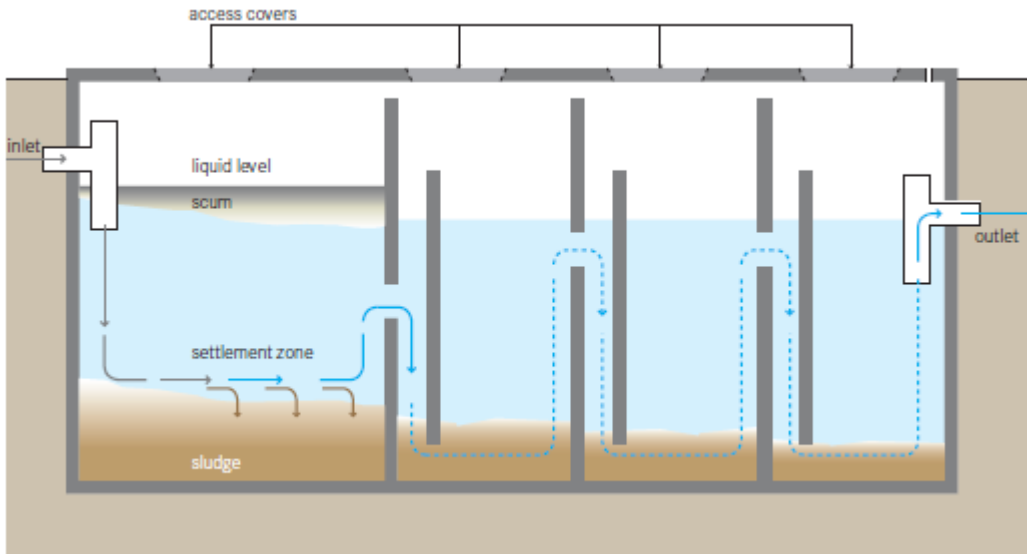
(Note; The CPHEEO Manual and NBC code IS 2470 Part I 1985 may be referred for exact calculations)

Table 2: Existing guide lines for design and construction of septic tanks

Parameters	Existing Guidelines	Source Of Guideline	General Observations
Location	Septic tanks are recommended only for individual homes, small communities and institutions whose contributory population size doesn't exceed 300 A sub soil dispersion system shall not be closer than 18 meters from any source of drinking water, such as well, to mitigate the possibility of bacterial pollution of water supply	CPHEEO Manual NBC, Part 3: Development Control Rules and General Building Requirement	<i>While all existing guidelines state that the location of septic tank should be given due consideration, in reality, the location of the septic tanks are practically based on the land</i>

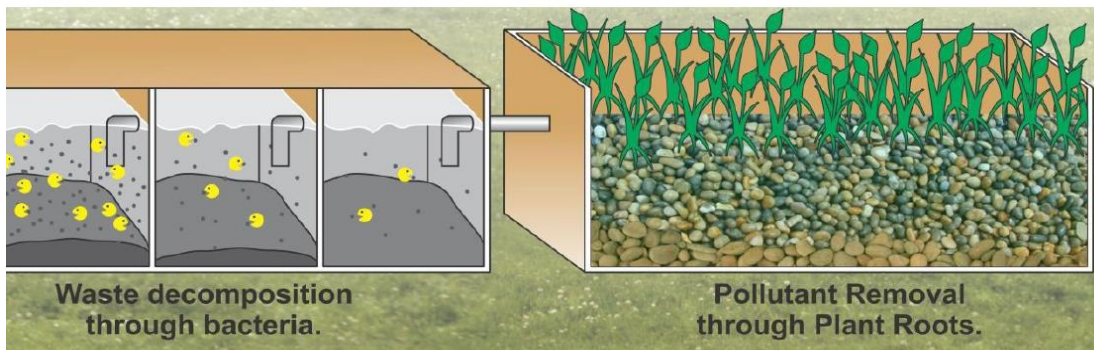
		s	availability within the household vicinity
	Septic tank should be located at a place open to sky, as far away as possible from the exterior of the wall of building and should not be located in swampy areas or areas prone to flooding.	IS 2470, Part-1	
Design and Construction	<p>Septic tanks should have a minimum width of 750 mm, depth of 1 meter below water level and a minimum water capacity of 1 cubic meter. The length of the tank shall be 2 to 4 times the width.</p> <p>The minimum nominal diameter of the pipe shall be 100 mm. Further at junctions of pipes in manholes, direction of flow from a branch connection shall not make an angle exceeding 45 degrees with the direction of flow in main pipe</p> <p>Every septic tank shall be provided with a ventilation pipe of at least 50 mm diameter</p> <p>The liquid depth should be 2-3 m and the length to depth ratio should be 2-3 to 1. The liquid depth of the septic tank should be calculated depending on the cleaning interval of the septic tank (For detail length, breadth and liquid depth for various number of users please refer the Manual); A provision of 300 mm should be made for free board</p> <p>When served for a population above 100, the septic tank may be divided into independent parallel chambers for operation and maintenance</p> <p>Baffles are provided at inlet and outlet and should dip 25 to 30 cm into and project 15 cm above the liquid. The invert of the outlet pipe should be provided at 5 to 7 cm below the invert level of inlet pipe.</p> <p>The height of the ventilation pipe should extend at least 2 m above the height of the highest building within 20 meters radius</p> <p>Improved Septic Tank” - the walls of the conventional septic tank can be replaced with baffle walls to have a multi chambered baffled septic tank. The paper states “This movement of wastewater inside the tank helps in creating the turbulent flow which causes enhanced mixing of the raw sewage with already existing activated sludge and accelerates the decomposition of the solids because of intensive contact between the activated sludge and fresh influent”.</p>	<p>NBC, Part 3: Development Control Rules and General Building Requirements;</p> <p>IS 2470, Part - 1</p> <p>CPHEEO; IS 2470, Part-1</p> <p>CSE Policy Paper on septage management in India</p>	<p>Local masons unaware of the existing design/construction guidelines for construction of septic tanks. The criterion governing the design and construction broadly is the land availability and the funds available with the house owner / property builders</p>

Design for improved septic tank- three chamber with anaerobic baffled reactor

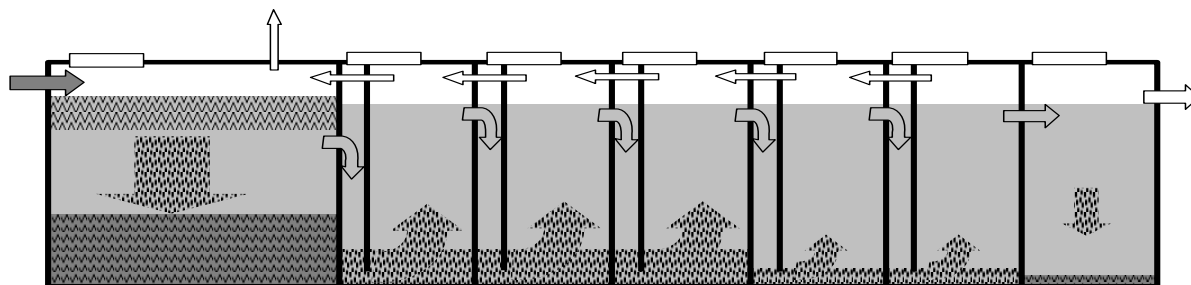


Bio-digesters at the household level

New Technologies



Anaerobic decentralized waste water treatment systems (DEWATs)



Annexure 2: Guidelines for Conversion of Insanitary Latrines into Pits

Table: Existing guide lines for leach pits

Parameters	Existing Guidelines	Source
Size(five members)	Dia – 1000 mm preferred but 750 mm also permitted where space is a constraint Depth – 1300 mm	CPHEEO
Emptying	Single pit – 6 years, Twin pit – 3 years each	CPHEEO
Shape	Circular preferred; but rectangular, oval and square also allowed where space is a constraint	CPHEEO
Location	Pits should be placed symmetrically at the back side of the pan. Can be located within premises, under foot pat/road/narrow lane The distance between foundation and pit should be between 0.2 to 1.3 m A minimum distance of 3 to 10 m from water sources such as tube wells and 3 to 10 m from water mains Water pipe should not cut across the pit	CPHEEO
Design and construction	The pits should be lined to avoid collapsing. Bricks joined in 1:6 mortar commonly used for lining. Stones or laterite bricks of cement concrete rings could also be used. Lining brick work 115 mm thick (half brick) with honey combing up to the invert level of incoming pipe or drain. Size of holes 50 mm wide up to the height of brick course Pit bottom should be left in natural condition RCC slab is used for pit cover Toilet pan is connected to the pit through a 75 mm brick channel of U shape	CPHEEO

Annexure 3: Form for Application for the License the Collection, Transportation and Disposal of Septage in GWMC

Paste Self-Attested
Recent Passport Size
Photograph

1. Name of the applicant: Shri/Ms _____
2. Nationality: Indian _____ Other _____
3. Address: Regd. Office: _____
Head office: _____
4. Telephone No.: (O) _____ Mobile No. _____ Email ID _____
5. Registration No. of Vehicle : _____
6. Pollution certificate of the vehicle valid up to: _____
7. Insurance of the vehicle valid up to: _____
8. Fitness of the vehicle valid up to: _____
9. Vehicle, whether fitted with GPS: _____
- 10 Details of the vehicles indicating model, type, capacity, leak proof, odour and spill proof having proper vacuum/ suction and discharging arrangement (Document proof of any may be enclosed).
- 11 Processing fee for license Rs. 1000/- (Non-refundable)
D.D. No. _____ Date _____ Bank _____

I/We certify that information given by me/us in column 1 to 11 are true to the best of my knowledge and belief. I also certify that I have read and understood the attached terms and conditions 1 to 13 and agree to abide by them. I agree that if any information given by me is found wrong the application for license will be liable for cancellation at any time.

Signature(s) of applicant(s)
Date: _____

No. of document attached: _____

Annexure 4: License for Collection and Transportation of Septage

In accordance with all the terms and conditions of the By-laws/ Regulations, Municipal Corporation Act rules, the special license conditions accompanying this license and applicable rules and laws of Government of Telangana, the permission is hereby granted to:

NAME OF LICENSEE.....
ADDRESS.....
.....

For the disposal of septage from septic tanks in GWMC

This license is based on information provided in the Septage Collection and Transportation License Application. This license is effective for a period of five years from date of issue, set forth below.

EFFECTIVE DATE

EXPIRATION DATE

The license may be suspended or revoked for Condition of Non Compliance and is not transferable. The original license shall be kept on file in the Licensee's office. A copy of this license shall be carried in every registered vehicle used by the Licensee.

Annexure 5: Record Keeping by Operator

Format for information collection by the operator

S. No	Name of the customer	Area and location	Date of request for desludging	Date of desludging completed	Type of septic tank	Age of septic tank	Quantity of septage desludged	User charge	Any accident /slippage	Next date of dsludging