



Ministry of Housing and Urban Affairs
Government of India



Swachh Bharat Mission - Urban

Guidance Document on **Equipment & Workforce Norms for Managing Waterborne Sanitation in India**



Central Public Health and Environmental Engineering Organisation (CPHEEO)

Ministry of Housing and Urban Affairs
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www.swachhbharaturban.gov.in | www.cpheeo.gov.in

November 2020



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FOREWORD

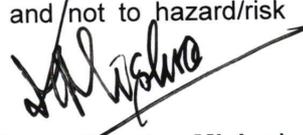
Unregulated urbanisation often leaves unintended consequences; but nothing could be more deplorable than the situation where a human being is exploited to put his life at stake to manage the excreta discharged by others.

It is, indeed, a matter of grave concern that more than 800 fatalities, involving persons tasked to clean the sewers and septic tanks without protective gears, have been reported since 1993. This loss of human lives is a sad reflection on our systems. Sanitary workers are responsible for keeping the environment clean and as such contribute to the socio-economic development of the country. The issue requires urgent attention of all stakeholders across different levels.

The Government has been seized of this important issue which has its social and economic consequences. In the backdrop of huge success of Swachh Bharat Mission (Urban), which has resulted in creation of modern sanitation infrastructure, Ministry of Housing and Urban Affairs plans to institute an annual inter-city challenge titled **Safai-Mitra Suraksha Challenge**, for all the municipal corporations, identified smart cities and State/UT capital cities.

I am confident that the contours of the challenge, as explained in succeeding pages, seeking improvement in management and mechanization of the processes involved, will soon lead to total elimination of any need for person to enter a sewer or a septic tank, except in exceptional and unavoidable circumstance and that too with full protective safety gear.

I take this opportunity to congratulate CPHEEO team for bringing out this Guidance Document on Equipment & Workforce Norms for Managing Waterborne Sanitation in India in a short span of time. I urge State/UTs and cities to make best use of this information for making their cities responsible and not to hazard/risk anyone's life in cleaning the sewer or septic tank.


(Durga Shanker Mishra)

New Delhi
12 November, 2020

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PREFACE

A modern, shining India of our dreams has no place for a news report where a poorly equipped person is exploited to enter a sewer and septic tank for its cleaning, thus putting his life at risk.

Nevertheless, such dismal incidents are being often reported from various parts of the country and many a poor persons have lost their lives in sewers and septic tanks, when requisite equipment, safety protocols and protective gear is easily available in the country.

With the intention to put a stop to this 'business as usual', this Ministry seeks participation of all States/UTs along with the designated Municipal Corporations in the national **Safai-Mitra Suraksha Challenge**. Capital cities of all States/ UTs will invariably participate.

This competition, devised by the Central Public Health and Environmental Engineering Organisation of this Ministry, will judge the participating cities in respect of adequacy of not only the holding of equipment and manpower but also the systems and processes. This Guidance Document on Equipment & Workforce Norms for Managing Waterborne Sanitation in India will be of immense help to all participating corporations in the challenge.

I am sure that each city will put its best foot forward and hereinafter there would be no cause or occasion for any mishap in a sewer or septic tank. Thus, leading us to hang our heads in shame.

I congratulate CPHEEO team particularly Dr V K Chaurasia JA(PHEE), Sh. Rohit Kakkar, DA(PHE), Sh. Sathish Kumar S, TO(PHE) and consultants Sh. Vipul Gulati, Dr. Manoj Kr Chaturvedi and Dr. S Saktheeswaran for bringing it in short span of time.

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Executive Summary

This Guidance Document on Equipment & Workforce Norms for Managing Waterborne Sanitation in India is prepared keeping in view the Safai-mitra Suraksha Challenge, 2021.

All sanitary structures like sewer and septic tanks which manage sewage are susceptible to getting choked at some point of time due to ingress and settling of solids and require regular cleaning or maintenance. Cleaning of sewer and septic tank sometimes require manual entry and if done without personal protective equipment & safety gears leads to injury to the sanitary worker and even death.

To eradicate this heinous act of hazardous cleaning, Govt. of India is adopting multi-pronged approach which includes regulatory and programmatic approaches. This guidance document contains inter-alia, norms for procurement by ULBs in respect of inspection equipments, cleaning equipments, norms for workmen for septic tank & sewer cleaning etc. It also contains norms for specially trained sewer entry professional as well as management of emergency cleaning requirements namely - setting up of Responsible Sanitation Authority and Sanitation Response Unit etc.

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1

Background

All sanitary structures, such as sewers and septic tanks, which are constructed to manage the flow of sewage are susceptible to getting choked at some point of time due to ingress and settling of solids and such foreign material and consequently require regular cleaning or maintenance.

There are three basic causes for a sewer/ septic tank disruption as under-

- (a) Hard choke: caused by growth of roots or solids such as stones and brickbats which are dumped irresponsibly through open manholes
- (b) Soft choke: due to deposition of silt, sand, oil and grease, and organic foreign material – such as discarded food material, hair, sanitary pad etc.
- (c) Structural Damage and design fault: due to poor workmanship and age of structures

Indiscriminate discarding of plastic and cloth rags exacerbates the situation.

Sometimes, despite the most efficient mechanization, manual entry into a sewer manhole or a septic tank chamber may become necessary and if done without personal protective equipment & safety gear, this could lead to injury to the sanitary worker and even to the extent of death.

To avoid this, Ministry has published various documents like

- (i) Manual on Sewerage and Sewage Treatment Systems, 2013
- (ii) National Policy on Faecal Sludge and Septage Management (FSSM), 2017
- (iii) Standard Operating Procedure (SOP) for Cleaning of Sewers and Septic Tanks, 2018
- (iv) Advisory on Emergency Response Sanitation Unit (ERSU), 2019

- (v) Advisory on On-site & Off-site Sewage Management Practices, 2020 etc.

Government of India is seized of the problem reported in media and at various forums from time to time. To eradicate this heinous act of hazardous cleaning, Govt. of India is adopting multi-pronged approach through its various Ministries including Ministry of Social Justice & Empowerment (MoSJE), Ministry of Housing & Urban Affairs (MoHUA) and Ministry of Jal Shakti (MoJS). While MoSJE has come out with ***Prohibition of Employment as Manual Scavengers and their Rehabilitation Rules, 2013***, prohibiting hazardous cleaning, MoHUA through its Missions like Swachh Bharat Mission & AMRUT is promoting infrastructure including mechanized cleaning of sewers & septic tanks.

Swachh Survekshan under Swachh Bharat Mission (SBM) has inculcated competitive spirit among Urban Local Bodies (ULBs) and States/UTs and has been of immense help in achieving objectives and even beyond, what has been envisaged under SBM.

Taking clue from above, Ministry is organising Safaimitra Suraksha Challenge-2021 between the Municipal Corporations of various States/UTs on the lines of Swachh Survekshan. A separate toolkit on the above is prepared and being launched on 19th November 2020 along with this guidance document on Equipment & Workforce Norms for Safaimitra Suraksha Challenge.

1.1 Waterborne Sanitary Systems

All domestic and institutional/ commercial sewage releases in urban areas of the country are connected to a Sanitary system.



A Sanitary system is understood to be as under-

- (i) A water seal bearing toilet seat
- (ii) A mechanical flushing apparatus or pour flush arrangement
- (iii) Discharges into wastewater recipients- a covered sewer with manholes or a 'septic tank' system* or a twin-pit arrangement.

*A septic tank system includes system trains permitted in IS 2470 or Mission Guidelines of Swachh Bharat Mission (U).

The wastewater receiving infrastructure in a ULB may be a public property or privately owned and managed, such as individual or group housing septic tanks or institution owned sewers.

The purpose of this document is to establish norms for minimum scale of equipment and trained manpower to be available in the ULB for efficient management of these infrastructures through-

- (a) Periodic/ preventive maintenance
- (b) Emergency repairs

The underlying goal is to mechanize all operation and maintenance aspects related to sewer and septic tank management especially the tasks that which may requiring confined space entry into a septic tank or a sewer through its manhole.

2

Choice of Equipment for Maintenance of Sewers and Septic Tanks

The basic preventive maintenance equipment for sewer cleaning depends on diameter of the pipe, while that for Septic tank cleaning depends on accessibility of the tank.

Various mechanical equipment have been developed for cleaning sewers and septic tanks. For Sewers, the core preventive maintenance equipment can be divided into the following groups-

2.1 Inspection Equipment and Techniques

Inspection equipment and techniques for assessing the condition of sewer and planning for its cleaning can broadly be grouped in to four groups, as given hereunder.

(i) Closed-circuit television (CCTV): Pipes that can be inspected by CCTV have inside diameters ranging

from 150 mm to 900 mm, but large diameter pipes may also be inspected by CCTV. The TV camera may be the traveling type or the towed type. Either the direct method (taking panoramic shots of the overall scene) or the side view method of taking local shots of only abnormal locations may be used.

(ii) Cameras: This technique involves a raft-mounted film camera and strobe light. This method requires less power than the CCTV, so the power cable is smaller and more manageable. Inspections using a camera are documented on polaroid still photographs that are referenced in a log book according to date, time, and location. In larger sewers where the surface access points are more than 300 m apart, camera inspections are commonly performed.

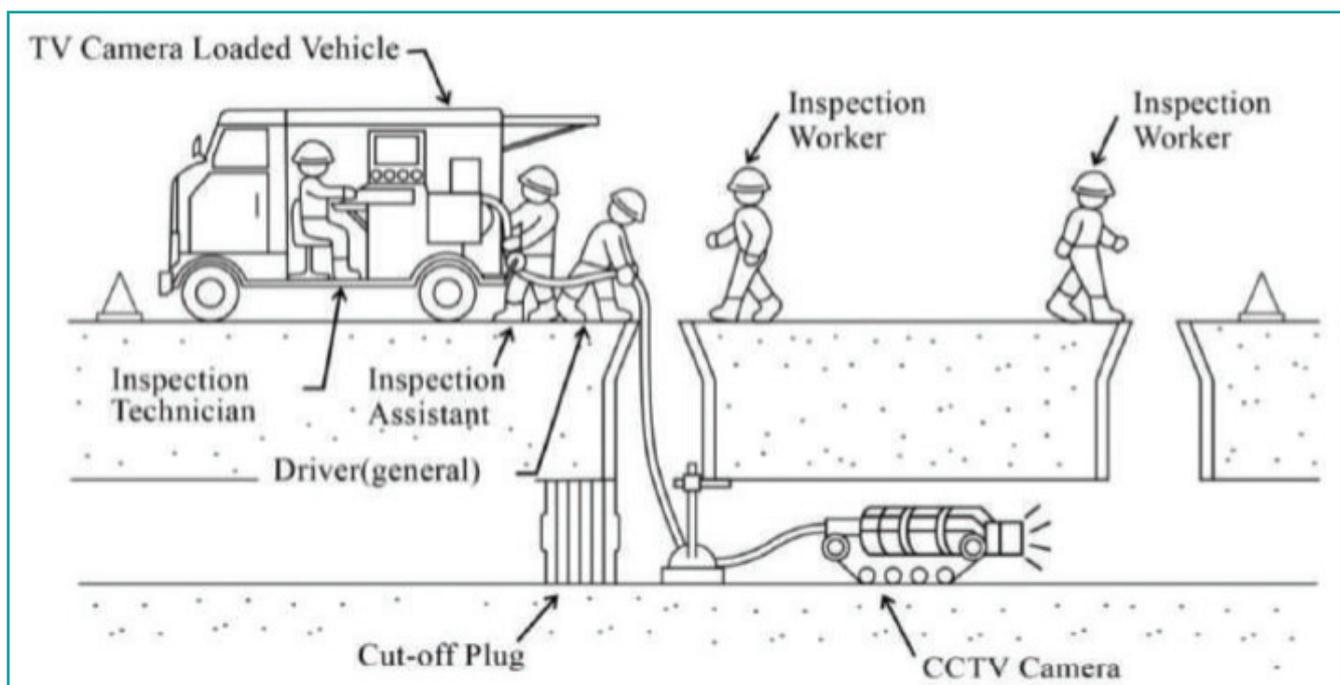


Figure 1 Illustration of CCTV camera inspection



Figure 2 Examples of sewer inspection camera

- (iii) Visual inspection: The visual inspection of manhole is performed by visually checking the manhole cover and the environment of the internal parts of the manhole.
- (iv) Lamping inspection: A camera is inserted and lowered into a maintenance hole and then positioned at the center of the junction of a manhole frame and the sewer. Visual images of the pipe interior are then recorded with the camera.

It is proposed that each sewer run and manhole should be inspected for deposition and damage on a two-year cycle.

2.2 Cleaning Equipment and Techniques

2.2.1 Mechanical

- (i) Rodding: Hand Rod or Power Rod:
 - Uses an engine and a drive unit with continuous rods or sectional rods.
 - As blades rotate they break up grease deposits, cut roots, and loosen debris.
 - Rodders also help thread the cables used for TV inspections and bucket machines.
 - Most effective in lines up to 300 mm (12 inches) in diameter.

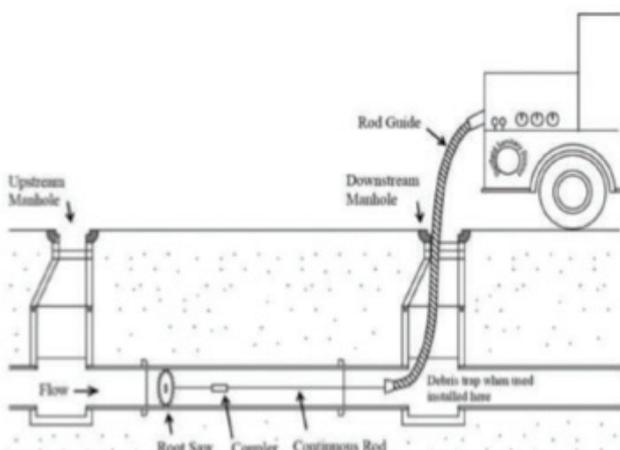


Figure 3 Power Rodding



Figure 4 Rodding Heads

- (ii) Bucket Machines:

- Cylindrical device, closed on one end with 2 opposing hinged jaws at the other.
- Jaws open and scrape off the material and deposit it in the bucket.
- Partially removes large deposits of silt, sand, gravel, and some types of solid waste.

2.2.2 Hydraulic

- (i) Balling:

- A threaded rubber cleaning ball that spins and scrubs the pipe interior as flow increases in the sewer line.
- Removes deposits of settled inorganic material and grease build-up.
- Most effective in sewers ranging in size from 13-60 cm (5-24 inches)

- (ii) Jetting:

- Directs high velocities of water against pipe walls.
- Removes debris and grease build-up, clears



Figure 5 Jetting Machine

blockages, and cuts roots within small diameter pipes.

- Efficient for routine cleaning of small diameter, low flow sewers.

(iii) Flushing:

- Introduces a heavy flow of water into the line at a manhole.
- Removes floatables and some sand and grit.
- Most effective when used in combination with other mechanical operations, such as rodding or bucket machine cleaning.

2.2.3 Scooter (including Sewer Croc):

- Round, rubber-rimmed, hinged metal shield that is mounted on a steel framework on small wheels. The shield works as a plug to build a head of water.
- Scours the inner walls of the pipe lines.
- Effective in removing heavy debris and cleaning grease from line.



Figure 6 Example of sewer croc



Figure 7 Bandicoot

2.2.4 Manhole Desilting Dredger (Clam-shell Grabber –including ‘Bandicoot’):

Manhole desilting dredger can be hydraulic as well as mechanical. It consists of a grab bucket on a wire rope, which is lowered into the manhole in an open condition with the help of a crane and pulley. On reaching the bottom of the manhole, the segments are closed, and the accumulated silt is picked up. The bucket can be closed by wire ropes or by a pneumatically operated cylinder.

All the above stated processes and equipment provide varying degree of success in removal of foreign material and maintaining flow in sewers, but these are more effective in small diameter laterals (150-300 mm diameter). For large dia. sewers, a Combination Hydro Vacuum machine (Commonly known as Super-sucker) is invariably required.

3

Norms for Preventive Maintenance Equipment of Sewers and Septic Tanks

India is a large country with more than 4000 ULBs with a wide spread of supported population and with different combinations of sewer and septic tank based sanitation infrastructure. There exists no standard document to fix the requirement of equipment and manpower. Therefore, based on review of technical literature, past contracts for equipment hiring by parastatals and discussions with various stakeholders, the following norms have been arrived at for Safaimitra Suraksha Challenge -

3.1 Basic Assumptions

- (a) All sewers and manholes are being inspected and cleaned at least once in a two-year cycle.
- (b) All Septic Tanks are being cleaned (emptied) at a three year cleaning cycle

3.2 For cleaning of Sewers

For a 2 year cleaning cycle, the requirement of Sewer O&M Vehicles can be fixed as under-

S. No.	Basis- on a 2 year cleaning cycle (4800 working hrs)		
1	Upto 300 mm dia sewer	@60 m/hr	288 KM/ veh*
2	Upto 600 mm dia sewer	@30 m/hr	144 KM/ veh
3	Upto 900 mm dia sewer	@ 15m/hr	72 KM/ veh

*Note: For smaller lateral sewers (upto 300 mm dia), the requirement of deployment of hydro-vac combination vehicles can be dispensed with for municipal bodies which have upto 200 KM of sewer network if the ULB possesses “adequate” alternate mechanical and hydraulic cleaning equipment. The adequacy will have to be proven by the ULB authorities.

3.3 For cleaning of Manholes

Assumption- One Manhole can be opened and cleaned of debris using a desilting machine in one hour at an average. Thus, one grabber can cater for 8 manholes per working day or 1300 manholes in a two-year cycle.

1 Manhole Desilting Machine (Grabber) is required per 1300 Manholes or 50 KM of sewer length.

3.4 For Septic Tank Covered Areas

As the dimensions of septic tanks in the country are non-standard and may range from 1.1 m³ per family as required under IS Code while the upper limits are quite large, it is proposed to mandate an average 3 year cleaning cycle (1000 days) and 1500 litres of septage to be emptied from each household.

At the same time, the capacity of septage hauling vehicles and towed cess pool tankers required also varies based on various factors such as congestion of space for movement of these vehicles and economics.

CPHEEO proposes a notional Equivalent Septage Haulage Vehicle (SHVeq) capable of collecting and transporting 9000 litres of septage per day in single or multiple shifts) and thus one SHVeq can cater for 6 households per day or 6000 HH in a 3 year cleaning cycle (30000 population equivalent).

Three septage tankers which collect and convey 3000 litres each to the designated septage management facility will equate to 1 SHVeq.

3.5 Holding of Special Equipment

Various other equipment for inspection and cleaning of sewers and septic tanks, as listed in Chapter 2 above,

are also required, depending on local characteristics and features of a ULB. The following holding norms will be considered as adequate for the Safaimitra Suraksha Challenge.

- a) Inspection Cameras- 1 set per 100 KM of sewers
- b) Hydro Jetting Machines- 1 Machine for 100 KM of Sewers
- c) Power Bucket machine- 1 Machine for 100 KM of sewers
- d) Power Rodding Apparatus - 1 Set for 50000 population
- e) Sewer Croc or equivalent (Hydraulic cutters)- 1 set per 200 KM of Sewers

A combination of above alternate equipment may be used for cleaning of sewers, instead of the combined hydro-vac machine, to meet the 2 year cleaning cycle. if the overall length of sewers to be handled is less than 200 KM

3.6 Sufficiency of Equipment

The ULB will need to assure that suitable equipment is available for its use– either through own inventory holding or that of the parastatal or state PHED establishment/ office responsible for managing sewers in the jurisdiction of the ULB or hired/ contracted from an empaneled sanitation service operator.

4

Manpower Requirement related to Sewer and Septic Tank Management

Determination of manpower for wastewater collection systems for any ULB is a complex problem, requiring consideration of many variables as given below:

- a) The inter se ratio of sewer and unsewered properties served with septic tanks
- b) The size of the system in kilometer of sewer lines.
- c) The age of the system.
- d) The standard of sewer construction.
- e) Funds available in the budget.
- f) The scope of the municipality's responsibility- such as the maintenance of lateral sewer lines and septic tank systems.
- g) The extent of private contractors' use.
- h) The establishment of minimum maintenance capabilities.
- i) The type of equipment used.
- j) The accessibility of work sites

4.1 Analysis of existing norms

It is observed that ULBs have differing adhoc norms for sanitation work force as a whole and for those Sewermen and sanitary beldars who are engaged in cleaning of sewers.

1. MoHUA/CPHEEO Manual: Govt. of India, Ministry of Urban Development 1972, has reportedly suggested a norm of 2.8 sanitation workers per thousand population, to handle all municipal waste from collection to disposal. Most of the staff will be engaged in conservancy of solid waste and sweeping- which is more manpower intensive task. CPHEEO Sewerage Manual of 2013 (Table 5.1) also recommends a certain minimum 'labour' holding against length of sewers. However, no such exercise has been done for septic tank management.

S. No.	Appointment	Population		S. No.	Appointment	Population	
		2L	5L			2L	5L
i	Superintendent	1	1	xi	Mason II	2	3
ii	Assistant Superintendent	1	1	xii	Mason I	2	3
iii	Maintenance Supervisor II	1	1	xiii	Maintenance Equipment Personnel	8	18
iv	Maintenance Supervisor I	2	3	xiv	Construction Equipment Personnel	4	9
v	Equipment Supervisor	1	1	xv	Auto. Equipment Personnel	3	6
vi	TV Technician II	2	3	xvi	Laborer	10	22
vii	TV Technician I	2	3	xvii	Dispatcher	2	3
viii	Foreman	3	6	xviii	Stock Clerk	2	3
ix	Maintenance Man II	5	9	xix	Clerk Typist	2	3
x	Maintenance Man I	17	33		TOTAL Sewer Maintenance Staff	70	131

2. USEPA Norms: As per a study on organizational setup suggested by US EPA wastewater collection systems (sewers and manholes) require the following municipal staff is needed for a city with 2 Lakh and 5 Lakh population. This study was taken up in 1974 and is based on holding data collected from 49 cities and towns.

It has been stated in the EPA document that the said staff is responsible for management of sewer mains and pump stations and also storm water drains but not the sewer laterals.

Further, it can be seen that the actual number of persons who will be involved to physically maintain the sewers and storm water drains on ground are the maintenance Men and their foremen, scaled at 25 persons for a town with 2 lakh population or 48 persons for a town with 5 lakh population. In support, they can further depend on a portion of the labourers and the maintenance equipment personnel (18 and 40 respectively for 2 Lakh and 5 Lakh population).

The organization of this workforce for a town of 5 Lakh population, is given in the chart below.

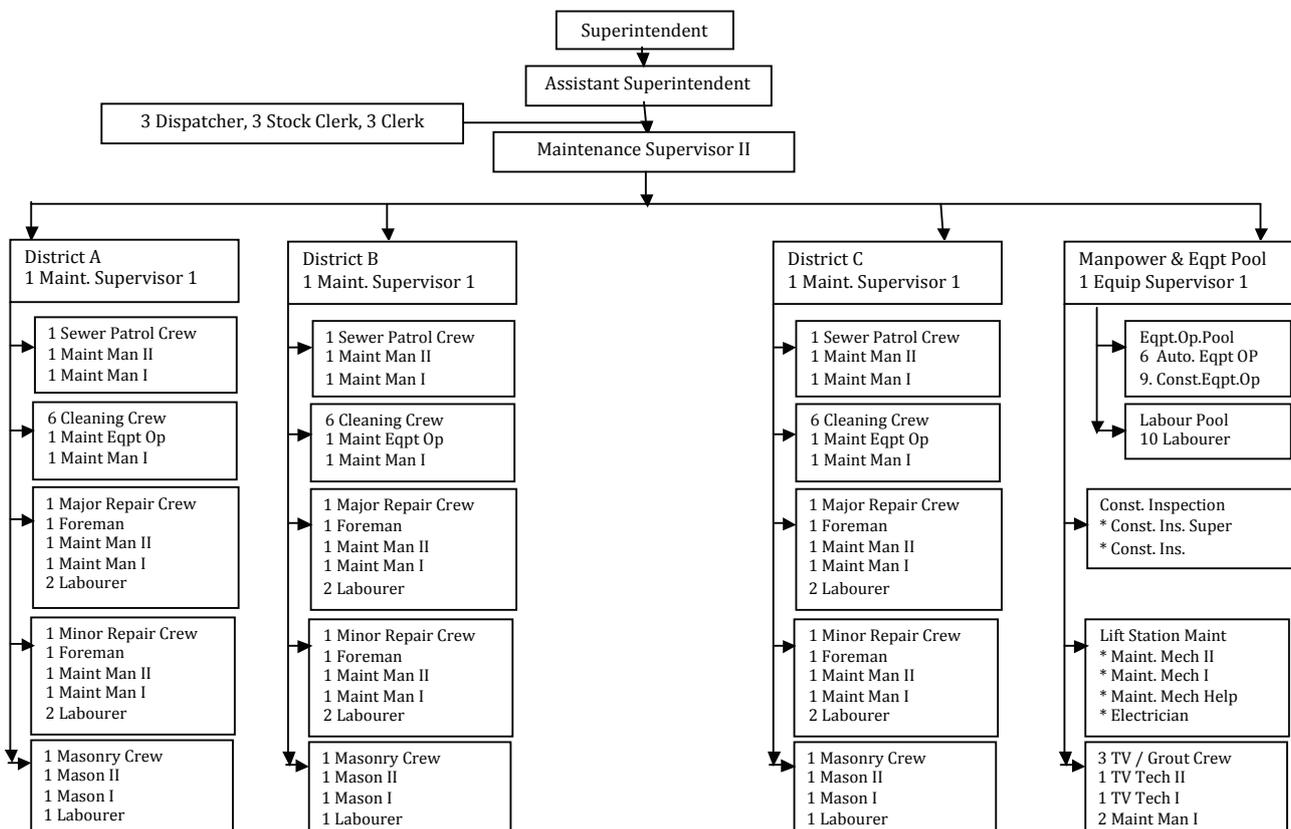
3. Chandigarh Municipal Corporation Norms:

Recruitment Rules of Chandigarh Municipal Corporation provides for a sanction of 1650 Safai Karamcharis as against 6 posts of “Sewer Men” and 50 posts of “Sanitary Beldar”. In addition, Recruitment rules of the Public Health Department of Chandigarh Administration caters for 10 Posts of Head Sewermen and 77 posts of Sewermen. The city has a population of about 10 lakhs and about 890 KM of sewers. Most of the ULB is connected to sewer system and the number of workmen caters for leave and training reserve. As against this, Amritsar MC and Faridabad MC have about 250 posts of sewermen each.

4.2 Norms for Sewermen for Sewer Management

India’s situation in 2020 can be expected to be more automated than in USA of 1974. Also we require municipal manpower to manage smaller lateral

Typical Organisation Chart for wastewater collection system maintenance
(In type and number of crews and man power requirements per crew)



sewers in each locality, as well as for individual septic tank based systems in our towns. Consequently, a judicious estimate for minimum essential manpower (only Sewermen and Septic Tank Beldars) has been worked out by CPHEEO for the purpose of the safaimitra suraksha challenge. Other constituents of sanitary work force are not being checked in the current exercise.

It is estimated that, a town of about 10 lakh residents, with about 70% sewer coverage, will require an estimated sewer and septic tank cleaning staff of about 100 sewer men and 50 beldars, this excludes staff such as the vehicle drivers, machine and pumping station operators, inspectors and supervisory staff (foremen level and above).

For quick calculation of number of sewer men required to undertake cleaning activities, the following minimum norms are to be considered for this challenge.

$$N_s = 22.5P_s - 0.5 P_s^2$$

Where N_s = No of Sewermen required

And P_s = Population dependent on Sewers in Lakh

4.3 Norms for Septic Tank Beldars required for Septic Tank Management

On other hand, cleaning and maintenance of septic tanks are usually managed by private owners and there is no organized setup at municipal level.

As the ministry has proposed that an average septic tank cleaning regime of 3 years may be established, where one gully emptier vehicle can manage 4 household level septic tanks per day. This caters for or 20 persons per day or 20000-30000 citizens for a 3 year (1000 working days cycle). One vehicle unit requires a staff of 3 persons including the driver. Thus a town/ city dependent on septic tank may cater for 2 Sanitary Beldars for 20000 affected citizens. Catering for leave reserve it may seek to provide a uniform norm of:

No of Septic Tank Beldars = 12 Nos per Lakh of population covered by septic tank

Example: Total Sanitary Workmen Requirement Calculation

A city of population of 3.5 Lakhs which has 40% effective sewer coverage,

$$\text{No of Sewermen} = 22.5 * (0.4 * 3.5) - 0.5 * (0.4 * 3.5)^2 = 30.5 \text{ persons}$$

No of Septic Tank Beldars = $12 * ((100 - 40 - 5) \% \text{ of } 3.5 \text{ Lakhs}) = 23.1 \text{ persons}$

5% is granted for twin pit or institutional sewerage, for which the Municipal body need not have to arrange

Total Sanitation personnel requirement for 3.5 lakh town with 40% sewer coverage = 53.6 = say 54 persons at workmen level.

This excludes the drivers of any mobile machinery and operators of fixed pumping stations.

If the city is completely seweraged then it will need

$$N_s = (22.5 * 3.5) - (0.5 * 3.5 * 2) = 73 \text{ sewer men}$$

This overall workmen requirement is the sum of ULBs own recruited employees, employees of the parastatal + empaneled/contracted trained workmen

4.4 Norms for Sewer Entry Professionals (SEPs) (Sewer Commandos)

While all sewer men should be generally trained on safety aspects, however there should be a special group of workmen which will be properly equipped, motivated, medically fit and highly trained to enter a sewer or septic tank in case of an inescapable emergency or practical requirement.

This team of SEPs will be maintained and tasked under direct control of the district's Responsible Sanitation Authority (RSA) and will be placed at disposal of the Sanitation Response Unit (SRU). Their remuneration also needs to be higher/ a special stipend provided, whenever they undertake the potentially risky tasks of entering a sewer or septic tank.

It is suggested that 7% of the authorized strength of sewer men+ trained sanitary beldar need to be so trained and equipped as SEPs.

Thus a town of 3.5 lakh population will need to have a strength of about 5.11 SEPs. Since each team needs to have two members, the town will be required to create 3 SEP teams. These persons can be sourced from own sewer men of the Municipal Agency, employees of the parastatal responsible to handle sanitation in the city, if any, staff of empanelled private sanitation service organization. The SEPs will be responsible to Sanitation Response Unit (SRU) and their employment will be managed by Officer incharge SRU as explained under in chapter 5.



Figure 8 Illustrative example of sewer entry professional

5

Organisation for Safe Management of Emergency Entry into Sewer or Septic Tank

5.1 Sanitation Response Unit (SRU)

In 2019, Ministry of Housing & Urban Affairs published an advisory for technical and managerial interventions for ensuring safety during sewer and septic tank cleaning under the name of Emergency Response Sanitation Unit (ERSU), which may be referred along with this booklet. ERSU or SRU is a professional, well trained, motivated and appropriately equipped establishment for the maintenance and management of sewers and septic tanks, thereby eliminating the accidents and fatalities caused by entry of workers into sewers and septic tanks without proper PPEs & training and non-adherence to security protocols.



Figure 9 Proposed emblem of SRU

5.2 Composition of SRU

S/ N	Officer/ Staff	Mechanism of Appointment	Nature of Appointment
1	Responsible Sanitation Authority (RSA)	Nomination through State Gazette Notification District Collector or Equivalent	In Addition to prime role as DC/ DM
2	Officer In-charge (OIC) of ERSU	Through Municipal or District Office Order Executive Engineer or Equivalent AEE or Eq. for ULBs < 2 Lakh	Additional Role
4	Duty/ Entry Supervisor	Through Municipal or District Office Order Junior Engineer or Sanitary Inspector	Additional Role on rotation basis
5	Administrative Supervisor	Through Municipal or District Office Order Junior Engineer or Sanitary Inspector or Eq. Ministerial	Full Time
6	Call centre Attendant	Through Municipal or District Office Order	Full Time/ Outsourced
7	Sewer Entry Professionals (Sewer Commandos)	Through Municipal or District Office Order 7% of Municipal sewer men/ beldars or sewer men of parastatal/ PHED or Empanelled PSSO workmen	Additional Role

“Additional role implies that the person will be carrying out his normal assigned duties on a day to day basis unless he or she is called up to undertake the SRU task”.

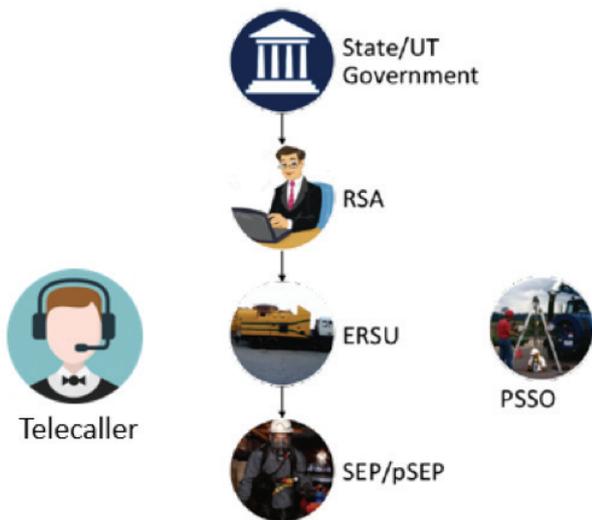


Figure 10 Composition of SRU

5.3 Equipment Holding for SRU

5% of the core O&M equipment for Sewers and Septic tank, as worked out at para 3.2 to 3.5 above, will be placed at disposal of the RSA through an office order. The Municipal body may continue to use the equipment, so that it doesn't lie idle, but will immediately release the same if asked by the Officer in charge of ERSU for their purpose.

OiC ERSU will attempt to use the appropriate O&M equipment to rehabilitate the sewer or septic tank, before committing the SEPs to enter the hazardous space with full protection.

A special Sewer Emergency Vehicle (SEV) is under design. This vehicle will be held by the ERSU on full time basis and will possess all necessary mechanical and medical safety equipment which could be needed to deal with a sewer emergency. The holding of SEV will not be considered in the current challenge.

6

Personnel Protective Equipment (PPE) and Safety Gear

Each safai karamchari employed in a municipal body needs appropriate Personal Protective Equipment (PPE) as per the needs of his employment. In comparison, the sewer men and sanitary beldars are a special subgroup of safai karamcharis who are required to work in foul water and moist environment and hence they need protection from hazards of the particular environment.

Prohibition of Employment as Manual Scavengers and their Rehabilitation Rules, 2013 and the relevant IS Codes, list out 44 pieces of equipment which may form part of the PPE and Safety Gear for a sewer man.

Rule 4 states- Any person engaged to clean a sewer or a septic tank shall be provided by his employer, protective gear and safety devices including, but not limited to the following:

1. Air compressor for blower
2. Airline breathing apparatus
3. Airline respirator with manually operated air blower
4. Air Purifier, Gas mask/chin corcege
5. Artificial respiration Reticulate
6. Barrier caution tape
7. Barrier cream
8. Barrier cone
9. Blower
10. Breath mask
11. Breathing Apparatus
12. Caution board
13. Chlorine mask
14. Emergency medical oxygen resuscitator Kit
15. First Aid Box
16. Face Mask
17. Gas Monitor (4 gases)
18. Guide Pipe Set
19. Full body wader suit
20. Fishing wader suit attached with boots
21. Hand gloves
22. Head Lamp
23. Helmet
24. Helmet demolishing
25. Lead acetate paper
26. life guard pad
27. Modular Airlines Supply Trolley System
28. Normal face mask
29. Nylon rope ladder 5 metres
30. Nylon safety belt
31. Pocketbook
32. Port oxy
33. Raincoat
34. Reflecting Jacket
35. Safety belt
36. Safety body clothing
37. Safety body harness
38. Safety goggles
39. Safety Gumboots
40. Safety helmet
41. Safety showers
42. Safety torch
43. Safety Tripod Set
44. Search light

6.1 For purpose of the challenge, adequacy of Personal Protective Equipment will be considered as having been achieved if the following equipment is held in the Municipal Corporation in number equivalent to the sum of number of Sewermen and Sanitary Beldars required to be maintained as per formula given at paras 4.2 and 4.3 above.

6.1.1 PPE scaled items- To be held in number equal to Sewermen + sanitary beldars

- (i) Reflecting Jacket
- (ii) Safety helmet
- (iii) Normal face mask
- (iv) Hand gloves
- (v) Safety Gumboots
- (vi) Safety body clothing



Figure 11 Illustrative figure PPE scaled items

6.1.2 Safety Gear scaled items- Similarly, the holding of Safety Gear Sets will be considered adequate if the following equipment is maintained by the ULBs corresponding to the number of Sewer Entry professionals (SEPs) to be held by the ULB.

- (i) Safety Tripod Set- One per team
- (ii) Nylon Rope ladder- One per team
- (iii) Blower with Air Compressor- One per team
- (iv) Gas Monitor (4 Gases)- One per team
- (v) Full body Wader Suit- One per SEP
- (vi) Gas Mask- One per SEP
- (vii) Breathing Apparatus- One per SEP
- (viii) Safety body Harness- One per SEP
- (ix) Air Line Breathing Apparatus- One per team



Figure 12 Illustrative figure Safety Gear scaled items



Ministry of Housing and Urban Affairs
Government of India