M1

TRAINING MODULE
SEPTIC TANK TECHNICIAN

Sector: **GREEN JOBS**
Sub-Sector: **WASTE MANAGEMENT**
Ref ID: **SGJ/Q6402**

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C National Skill Development Corporation
Transforming the skill landscape

Ministry of Housing and Urban Affairs
Government of India

DAY-NULM
Deendayal Antyodaya Yojana
National Urban Livelihoods Mission

UMC
URBAN MANAGEMENT CENTRE

About Urban Management Centre (UMC)

UMC works towards professionalizing urban management in India and worldwide by providing technical assistance and support to city governments and facilitates change through peer-to-peer learning processes. It enhances the capacity of city governments by providing expertise and ready access to innovations on good governance implemented in India and abroad. It facilitates city governments to design, implement and evaluate municipal development and management projects. UMC extensively works in the areas of urban water and sanitation, heritage management, urban planning, urban health, municipal finance, urban management, urban transportation and institutional restructuring. More details are available on www.umcasia.org

DISCLAIMER

This training material has been prepared by Urban Management Centre (UMC) in consultation with Sector Skill Council for Green Jobs (SCJG) for all the aspiring youth who desire to gain special skills & gain meaningful & dignified livelihood in FSSM, sector.

The preparation of this manual would not be possible without the support and feedback of the Sector Council for Green Jobs (SCGJ) and the National Faecal Sludge and Septage Management Alliance (NFSSM Alliance) members.

ABOUT THIS TRAINING MANUAL

This training module is designed to enable training to become a Septic Tank Technician. This module will provide a learning support to understand the roles and responsibilities of a Septic Tank Technician

This training module includes the following learning components required to become a Septic Tank Technician:

1. Assessment of site and size of septic tank
2. Excavation and construction of septic tank
3. Installation of prefabricated septic tank
4. Repair and maintenance of septic tank
5. Ensuring personal health and safety during construction of septic tank
6. Working effectively with others
7. Employability and entrepreneurship skills

JOB ROLE

M1

Name of the Job Role

Septic Tank Technician

NSQF level

4

Education Qualification

Minimum- 10th Pass

Maximum- Not Applicable

Job Entry Age

18 years

Experience

Minimum 2 years of experience in supervising masons and installation of septic tanks

TRAINING MODULES

M1

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

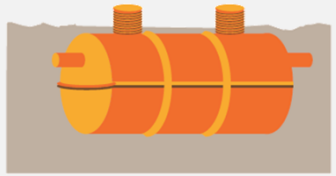
1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

2 EXCAVATION AND CONSTRUCTION OF SEPTIC TANK / SOAK PIT

Outcome:

1. Marking of the layout of the septic tanks
2. Excavation the site
3. Construction the septic tanks
4. Dos and Don'ts in the construction of septic tanks

3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY WHILE CONSTRUCTING A SEPTIC TANK

Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS

Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

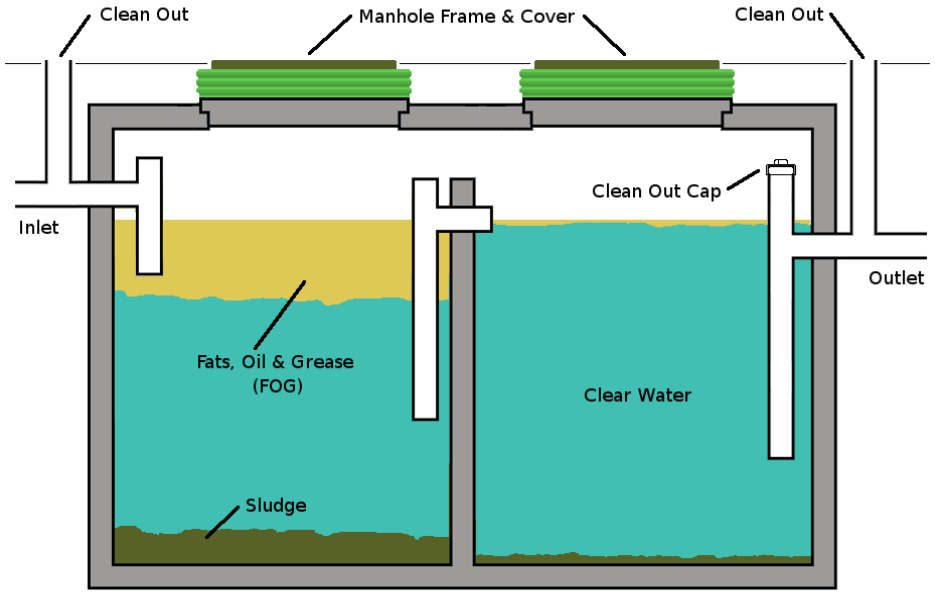
7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

WHAT IS A SEPTIC TANK?

- Septic tank is an underground system to treat wastewater.
- The wastewater is collected through inlet pipes from toilet to the septic tank where solid particles get settled down and water gets treated.
- The outflow is then directed to the soak pit where it is filtered, and it then percolates into the ground for further purification.



Basic design of a septic tank

Diagram Source: www.epa.gov

IMPORTANCE OF SEPTIC TANK

- Providing a septic tank facility in the absence of a safe wastewater disposal system is very important.
- In absence of one, will lead to release of the wastewater containing human excreta, directly into the ground, all the untreated water will percolate into the sub-soil and may contaminate the groundwater.

Percolation of wastewater into sub soil may lead to contamination of fresh water used for washing, bathing, cooking and drinking

Root cause of severe water borne diseases causing health issues

In case of natural calamities (eg. Floods etc) all the contaminated water will get mixed with the flood water

Percolation of wastewater into sub soil may also lead to environmental damage and issues

Icons source: www.flaticon.com and ehs.princeton.info

WHO IS A SEPTIC TANK TECHNICIAN?

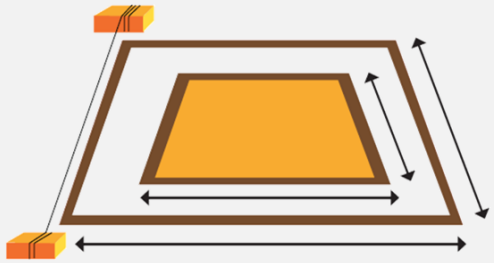
M1

Person involved in construction & installation of septic tank at site

SEPTIC TANK TECHNICIAN : ROLES & RESPONSIBILITIES

M1

Fabrication of different types of septic tanks/ soak pit and install at the site



Selection of suitable configuration of septic tanks

Undertake the work of repair and maintenance of existing septic tanks

Record keeping

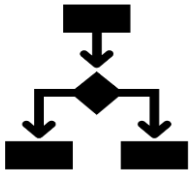
Use and Maintenance of PPE

Name of Module

Module 1: ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Theory

Practical



Outcomes

1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

Icons Source: www.flaticon.com

TRAINING MODULES

M1

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Outcome:

1. Marking of the layout of the septic tanks
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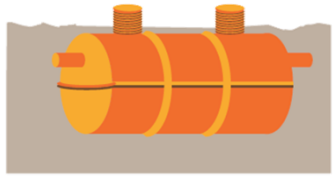
3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY WHILE CONSTRUCTING A SEPTIC TANK

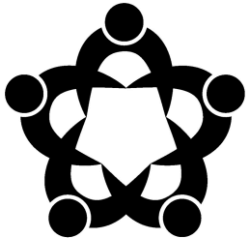
Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS



Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

MODULE 1 - ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

M1

OUTCOME

STEP 1 - Location and Assessment of site of septic tank

STEP 2 - Various design of a septic tank

STEP 3 - Estimation and material needed for construction

STEP 4 - Tools required for operations

STEP 1- LOCATION & ASSESSMENT OF SITE OF SEPTIC TANK

M1

LOCATION OF SEPTIC TANK

1. **Draw a plan of a septic tank** with proper distance from water bodies, nearest building, sewer, and water line or any prominent manmade or natural features etc.

2. **The proper distance would help in to avoid contamination** of drinking water sources and other problems.

3. Septic tank should **not be constructed at low lying areas or water-logged area.**

CHOOSING A SUITABLE SITE FOR CONSTRUCTION OF SEPTIC TANK

1. Site should be a **minimum of 15 meters away from any water body and 3 meters away from the nearest building** and downhill from the source.

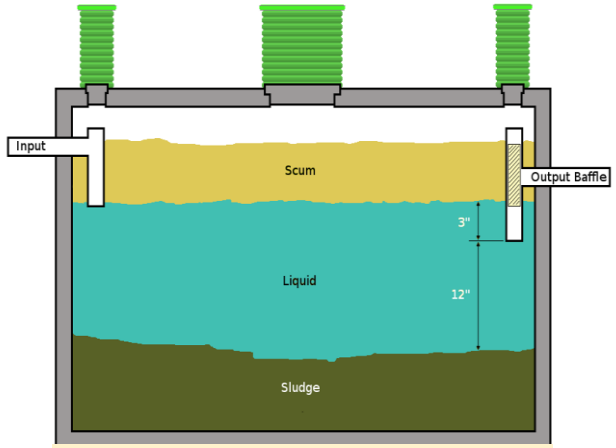
2. Follow the **"Two-Meter Rule" while constructing the septic tanks:** if there are 2 meters of fine sand or loam separating the drain field and the groundwater then virtually all pathogens will be removed

Distance with various septic tank recovery area	
Distance from	**Minimum distance required**
Water Bodies	15.00 Meters
Pressure Water Pipeline	10 Feet
Sewer Line	15.00 Meters
Building Foundation or Nearest Building	3.00 Meters
Nearest Building	3.00 Meters
Deep Well	50 Feet
Shallow well	100 Feet
Streams and waterways	100 Feet
Slopes greater than 25 percent	25 Feet

Data and Table Source: http://www.bvsde.paho.org/texcom/desastres/oxfamstg.pdf

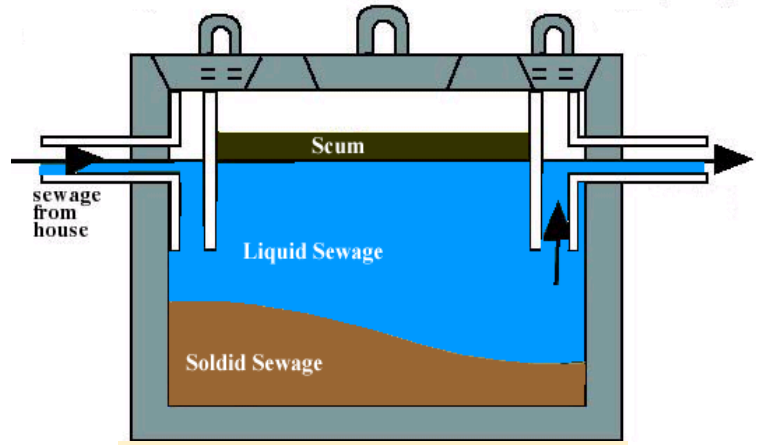
STEP 2- VARIOUS DESIGN OF A SEPTIC TANK

M1

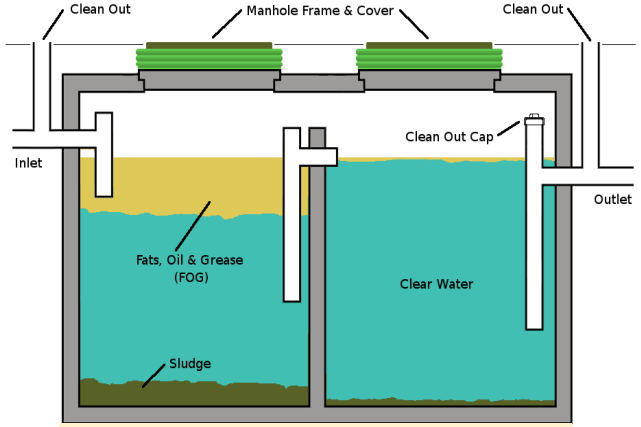


Rectangular design of Septic tank

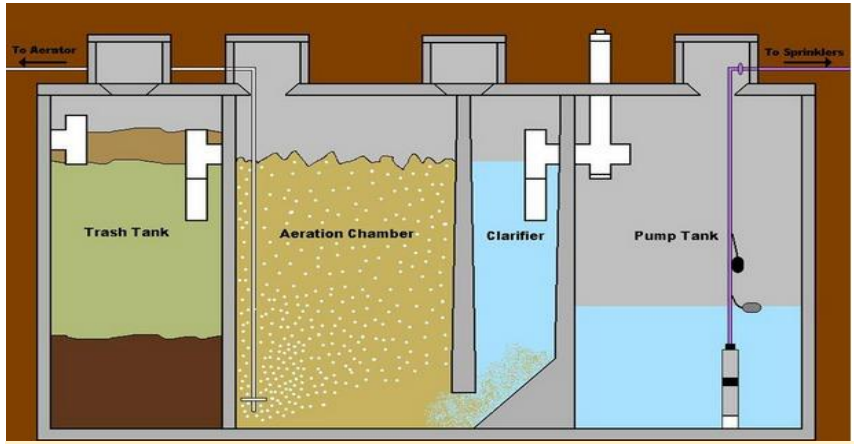
Circular design of Septic tank



Single Chamber Septic tank



Double Chamber Septic tank



Triple Chamber Septic tank

RECOMMENDED SIZE OF SEPTIC TANKS

M1

The recommended size of septic tanks for 20 users and Housing colonies up to 300 persons

No of Users	Length (in Meter)	Breadth (In Meter)	Liquid Depth (Cleaning Interval of)	
			1 Year	2 Year
5	1.5	0.75	1.0	1.05
10	2.0	0.90	1.0	1.40
15	2.0	0.90	1.3	2.00
20	2.3	1.10	1.3	1.80

1. A provision of **300 mm should be made for free board**
2. 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.
3. 3. For population over 100, the tank may be divided into independent parallel chambers of maintenance and cleaning

No of Users	Length (in Meter)	Breadth (In Meter)	Liquid Depth (Cleaning Interval of)	
			2 Years	3 Years
50	5.0	2.0	1.0	1.24
100	7.5	2.65	1.0	1.24
150	10.0	3.0	1.0	2.24
200	12.0	3.30	1.0	1.24
300	15.0	4.00	1.0	1.24

1. The capacities are recommended on the assumption that discharge from only WC will be treated in septic tank.
2. A provision of 300 mm should be made for free broad.
3. 3. The sizes of septic tank are based on certain assumption on peak discharges, as estimated in IS: 2470 (part 1) and while choosing the size of septic tank exact calculations shall be made.

Source: http://cpheeo.gov.in/upload/uploadfiles/files/engineering_chapter9.pdf

STEP 3 – ESTIMATION & MATERIAL NEEDED FOR CONSTRUCTION

M1

- The construction of septic tank needs bricks, cement, sand, stone, plumbing fixtures etc.
- Store appropriate quantity of materials before starting the construction work.
- Required technicians: plumbers, masons, labours

Types of materials and quantity required			
S. No.	Name of material	Quantity required	Price
1	Cement	As per requirement of capacity	As per market
2	Concrete		
3	PVC pipe		
4	Bricks		
5	Fine sand		
6	TMT bars or Iron Rod		
7	Stones		
8	Roof slab		
9	Sand		
10	Adhesive for septic tank		

STEP 4 – TOOLS REQUIRED FOR OPERATIONS

M1

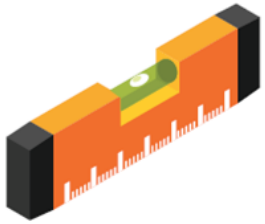
Trowel

Blocking Chisel

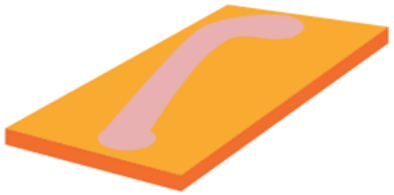
Hammer

Plumb Bobs

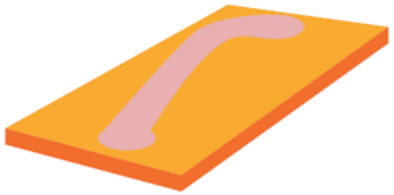
Square



Mason’s level



Trowel /Gurmala



Plaster Trowel

Measurement Tape

Mixing tools

SUMMARY

After completion of this training manual participants will be able to:

1. Survey and assess the size of septic tank
2. Understand regarding the location of a septic tank
3. Understand about the various design of a septic tank
4. Understand about the estimation and material needed for construction
5. Understand about the tools required to construct a septic tank

EXERCISE

Instructions for Trainer:

1. Divide participants in three groups.
2. Assign task to each group.
3. Ask them to list down or explain the answers.

Tasks for the groups:

Group 1: List down the various designs of septic tanks

Group 2: List down the material required for construction of septic tanks

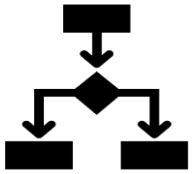
Group 3: List down the tools required for operations

Name of Module

Module 2: EXCAVATION AND CONSTRUCTION OF SEPTIC TANK

Theory

Practical



Outcomes

1. Understanding the Marking of the layout of the septic tanks
2. Understanding the process of Excavation of the site
3. Process of Construction of septic tanks
4. Do's and Dont's in the construction of septic tanks

Icons Source: www.flaticon.com

TRAINING MODULES

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

2 EXCAVATION AND CONSTRUCTION AND OF SEPTIC TANK / SOAK PIT

Outcome:

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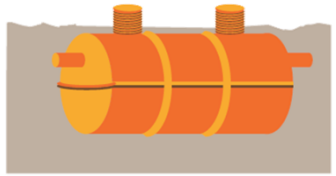
3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY WHILE CONSTRUCTING A SEPTIC TANK

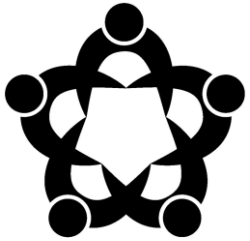
Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS



Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

OUTCOME

STEP 1- Understanding the Marking of the layout of the septic tanks

STEP 2-Understanding the process of Excavation of the site

STEP 3- Process of Construction of septic tanks

STEP 4- Do’s and Dont’s in the construction of septic tanks

STEP 1- EXCAVATION OF SITE AS PER SPECIFICATION

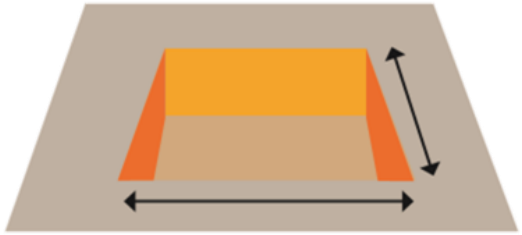
M2

Process of excavating pits for septic tank

1

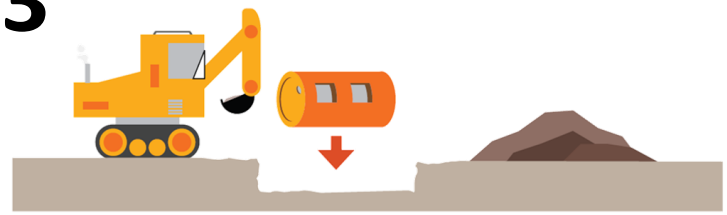
Clean the site identified for the septic tank

2



Mark the specification of septic tank layout

3



Carry out excavation for foundation of septic tank

4

Carry out excavation to desired depth of septic tank

5

Ensure health and safety while doing excavation

Icons Source: www.flaticon.com

COMPONENTS OF SEPTIC TANK TO BE COSNTRUCTED

The following are the components of the septic tank which are to be constructed

1. Septic tank
2. Inlet pipe
3. Inlet baffle & outlet baffle
4. Outlet pipe
5. Ventilation or vent pipe
6. Partition wall
7. Access opening cover

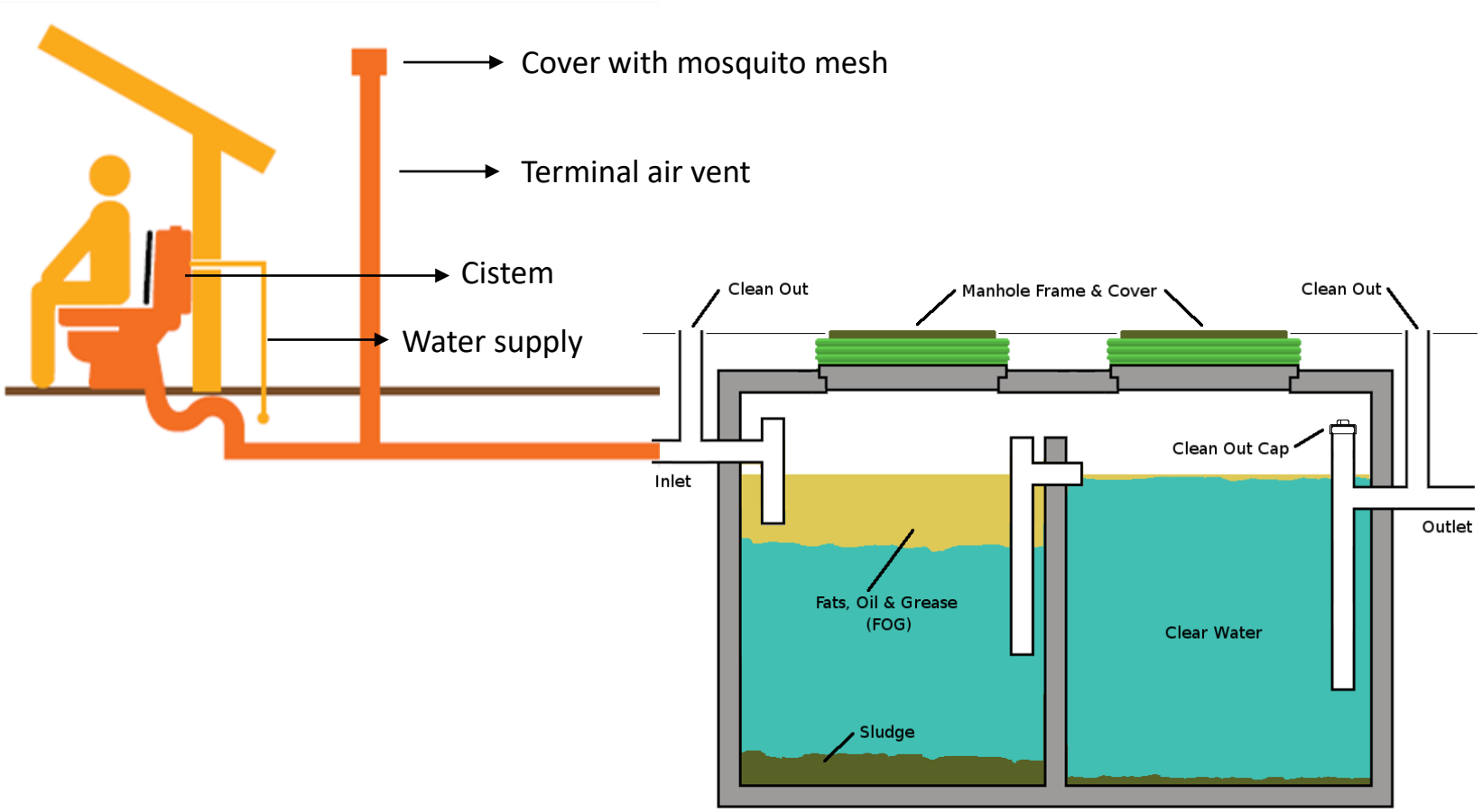


Diagram Source: www.epa.gov

STEPS FOR SEPTIC TANK CONSTRUCTION

STEP 1
Excavate the site of septic tank

STEP 2
The base of septic tank is to be level

STEP 3
Concrete is mixed & poured

STEP 4
Once the concrete floor is set, construct block walls

STEP 5
Fill external wall blocks with concrete

STEP 6
Plaster inside the external walls

STEP 7
Carry out leakage test after drying of plaster

STEP 8
Empty septic tank & repair if there are any leakage

STEP 9
Construct the dividing wall

STEP 10
Boxing of tank roof & access lids is to be installed

STEP 11
Pour the concrete roof slab

STEP 12
Pour the concrete access lids

STEP 13
Complete all pipe work to & from septic tank

STEP 14
Install septic tank filter & connect to toilet

STEP 15
Install access lids & seal edges with mortar

SOP FOR CONSTRUCTION OF SEPTIC TANKS

To start construction of the septic tank, firstly, finalize its location

1. Inlet pipe: A PVC T pipe (Minimum 100 mm dia) shall be fixed inside the tank, with top limb rising above scum level and the bottom limb extending about 300 mm below the top water level.

Plan of septic tank

Inlet & Outlet Pipe Standards

2. Floor: Cement Concrete Floor: The floor may be cement concrete of minimum M 15 grade (1:2:4)
RCC Floor: 150 mm thick concrete slab reinforced with 12 mm bars at 200 mm c/c both ways in concrete mix 1:2:4.

3. Walls: For Small domestic septic tanks, the walls are commonly built of bricks (230 mm thick). Concrete blocks or stone and should be rendered on the inside with 12 mm thick cement mortar to make them watertight.
Brick masonry: Brick wall thickness should not be less than 230 mm.
Stone masonry: Thickness of wall with stone masonry should be minimum 370 mm.
RCC: 150 mm thick RCC (reinforced cement concrete) wall in 1:3:6 concrete mix.

Septic Tanks walls and partition wall standard

SOP FOR CONSTRUCTION OF SEPTIC TANKS

4. Inlet baffle and outlet baffle: Baffles are generally provided at both the inlet and the outlet, in the absence of inlet tee and outlet tee. It should be dip 25 to 30 cm into and project 15 cm above the liquid. The invert of the outlet pipe should be placed at a level 5 to 7 cm below the invert level of the inlet pipe. Baffled inlet will distribute the flow more evenly along the width of the tank.

5. Partition wall: For larger capacities, a two-compartment tank is constructed with a partition wall at a distance of about two-thirds the length from the inlet.

6. Access Cover: Each component of a septic tank should be provided with a rectangular access opening, measuring not less than 455 * 610 mm or a circular opening of 500 mm diameter. The cover to access opening should be of reinforced concrete or of cast iron and should incorporate a suitable lifting device.

Access Cover, Septic Tank

7. Ventilation Pipe: Every septic tank should be provided with a ventilation pipe (with mosquito proof mesh on top) at least 50 mm in diameter.

DO's – EXCAVATION, FABRICATION & INSTALLATION

M2

Keep the access cover of the septic tank covered

Inspection of the septic tank needs to be done every 2 to 3 years

Use water efficient plumbing fixtures or machines

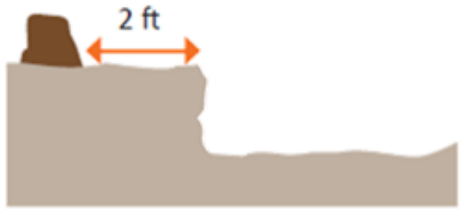
Check your water fixtures for any leakages in the pipeline regularly

DONT'S – EXCAVATION, FABRICATION & INSTALLATION

M2

Don't enter an unprotected trench during excavation

Don't allow heavy equipment near the excavation edges



Don't allow surcharge such as excess soil, other materials, etc. to be placed within 2 feet of the excavation edges.

Do not allow work to occur under raised loads

SUMMARY

After completion of this training manual participants will be able to:

1. Understand about excavation of septic tank site.

2. Understand about process of construction of septic tanks.

3. Understand about do’s and dont’s of excavation, fabrication and installation of septic tanks.

QUIZ

Answer the following

Q.1. What are the components of the septic tanks which need to be constructed?

Q.2. The workers are to protect themselves and other team members in case of mishaps.

a. True

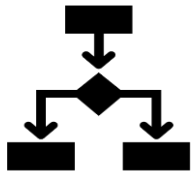
b. False

Name of Module

Module 3: INSTALLATION OF PREFABRICATED SEPTIC TANK

Theory

Practical



Outcomes

OUTCOME:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Dont's for installation of prefabricated septic tanks

TRAINING MODULES

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

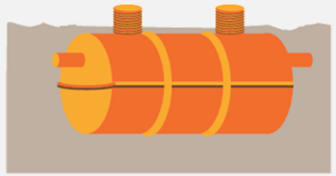
1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

2 EXCAVATION AND CONSTRUCTION OF SEPTIC TANK / SOAK PIT

Outcome:

1. Marking of the layout of the septic tanks
2. Excavation the site
3. Construction the septic tanks
4. Dos and Don'ts in the construction of septic tanks

3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY WHILE CONSTRUCTING A SEPTIC TANK

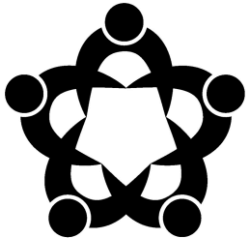
Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS



Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

MODULE 3 - INSTALLATION OF PREFABRICATED SEPTIC TANK

OUTCOME

STEP 1 - Understand about types of prefabricated septic tanks

STEP 2- Process of installation of prefabricated septic tanks

STEP 3- Do’s and Dont’s for installation of prefabricated septic tanks

STEP 1- TYPES OF PREFABRICATED SEPTIC TANKS

M3

1

Plastic septic tanks

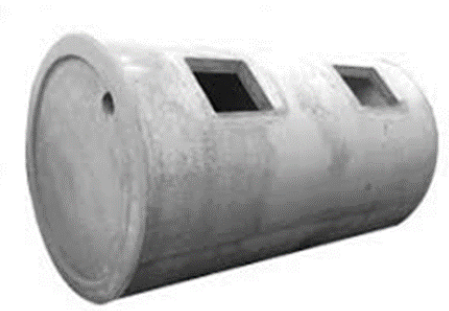
2

Steel septic tanks

3

Fiberglass septic tanks

4



Concrete septic tanks

STEP 2 – TYPES OF INSTALLATION

M3

Installation at Dry Site
Remove large stones
Base layer – 200 MM

Installation at Wet Site
Water table may rise higher than base of tank
Base layer – 300 MM

Installation at Hilly area

Urban Management Centre

Icons Source: www.flaticon.com

STEP 2- INSTALLATION CHECKLIST

M3

1. Ensure suitability of the soil/ ground conditions for construction of a septic tank.

2. Inspect the prefabricated septic tank for damage before installation.

3. Place in proper orientation to the height of inlet and outlet pipe.

4. Inspect the elevation of septic tanks to meet the height of the inlet pipe.

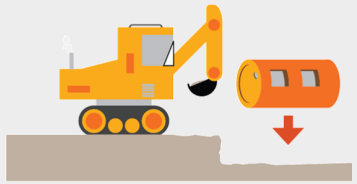
5. The septic tank should be subject to visual inspection.

6. Any damage in the tanks are to be notified to the customer or to the supplier.

STEP 3 - PROCESS OF INSTALLATION

M3

Site Conditions



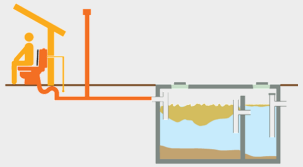
Excavation

Bedding

Placement of prefabricated tanks

Joint Seals

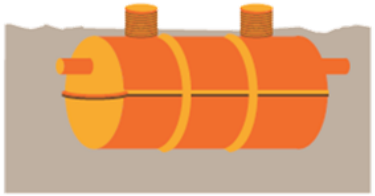
Backfilling



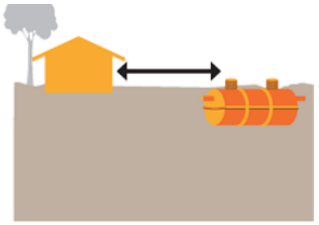
Connect toilet with septic tank

DO's – INSTALLATION OF PREFABRICATED SEPTIC TANK

M3

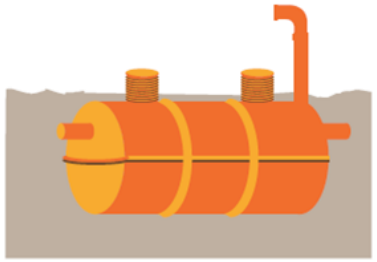


1. Use PPE during installation



2. Install away from sewer line, water bodies, building & trees

3. Ensure that connection between in and out tank is watertight



4. Install ventilation pipe

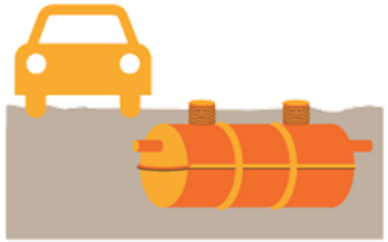
5. Ensure that water runoff from sloping terrain, adjacent structures etc. is diverted away from the septic tank

6. Give your contact number to customer so that they can contact if there any emergency

Icons Source: www.flaticon.com

DONT's – INSTALLATION OF PREFABRICATED SEPTIC TANK

1. Locate tanks at the bottom of sloping terrain unless adequate measures are taken to prevent water runoff from infiltrating the tank excavation

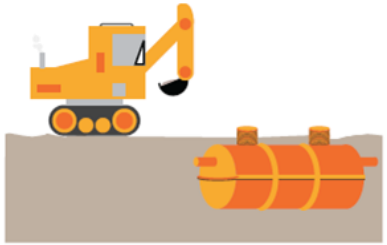


2. Don't allow vehicular traffic over the location of the septic tank.

3. Don't plant a tree, shrubs or a garden near the septic tank. it may clog or damage the septic tank

4. Don't allow the Kitchen water into the septic tank

5. Don't allow acid in the septic tank



6. Don't excavate the area, where the septic tank is located

SUMMARY

After completion of this training manual participants will become aware about:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Dont's for installation of prefabricated septic tanks

EXERCISE

Number these pictures in right order

Joint seals

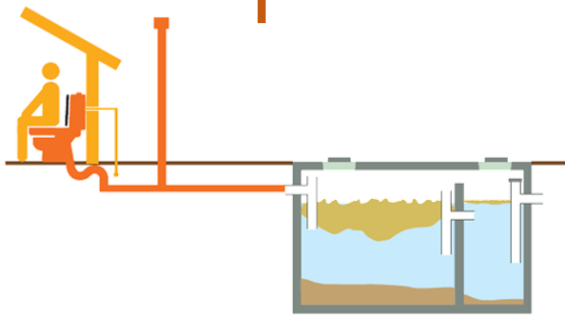
Placement of prefabricated tanks

Backfilling

Bedding

Excavation

Site conditions



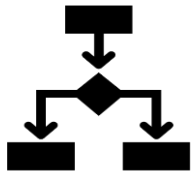
Connect toilet with septic tank

Name of Module

Module 4: REPAIR AND MAINTAINENCE OF SEPTIC TANK/SOAK PIT

Theory

Practical



Outcomes

Outcome:

Repair and maintain the septic tanks as per the CPHEEO norms

Test the functionality of septic tanks post repair

Diagnose the issues of the septic tank

Dos and Don’ts while repairing the septic tanks

Icons Source: www.flaticon.com

TRAINING MODULES

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

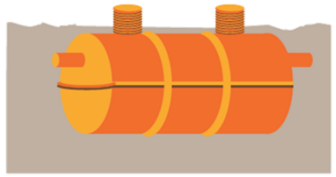
1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

2 EXCAVATION AND CONSTRUCTION OF SEPTIC TANK / SOAK PIT

Outcome:

1. Marking of the layout of the septic tanks
2. Excavation the site
3. Construction the septic tanks
4. Dos and Don'ts in the construction of septic tanks

3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Installation the prefabricated septic tanks
2. Demonstrate the working principle of prefabricated septic tanks
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY WHILE CONSTRUCTING A SEPTIC TANK

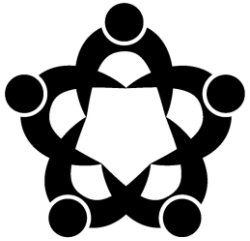
Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Source: NSDC Septic Tank Technician Model Curriculum (www.nsdc.org) Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS



Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

MODEUL 4 - REPAIR & MAINTENANCE OF SEPTIC TANK/SOAK PIT

M4

OUTCOME

STEP 1 - Repair and maintain the septic tanks as per the CPHEEO norms

STEP 2 - Test the functionality of septic tanks post repair

STEP 3 - Diagnose the issues of the septic tank

STEP 4 - Dos and Don’ts while repairing the septic tanks

STEP 1- SIGNS OF REPAIR & MAINTENCE

M4

Standing water over the tank

Standing water in the drain field/ leach field

Slow or sluggish drains

Toilets that require repeated flushes

Bubbling or gurgling coming from the drains

Clogged Drains

Water or sewage backing up through all the drains in the building

Urban Management Centre

Icons Source: www.flaticon.com

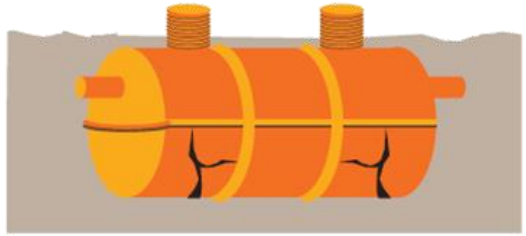
STEP 2 - MAJOR REPAIRS

1

Repair of septic tank cover

Many septic tanks covers are made from plastic or cement. These covers need to repair or replace if they break down.

2



Repair of Septic tank leakage

If the septic tank got damaged or tank has leakage in this situation septic tank need to be replaced.

3

Repair of the drainage system of septic tanks

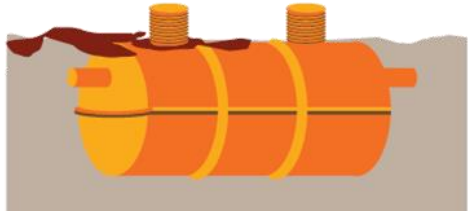
The drainage system of septic tank may slow or sluggish. Sometimes it may be not working properly, and sewage is coming back.

STEP 4 – MINOR REPAIRS

1

Clogged lines
The septic tank line may clog, and water is not passing through the line. Water may be standing in the line.

2



An overflow of the septic tank
Sometime septic tank is overflow and bubbling are coming from the tank. In this situation, the septic tank needs to be Desludge.

3

Sewage backups into the building
The sewage backups happened if the septic tanks are an overflow of drainage line is blocked.

4

A blocked leach field/ drain field
Because of blockages in the drain, water may stand in the pipe and inside of pipe may be sluggish.

STEP 5 - STEPS FOR REPAIR & MAINTAINENCE

1

Identification of the problems or failure of septic tanks

2

Emptying the septic tanks for major repair

3

Estimate the time and materials needed for major repair and maintenance of septic tanks

4

Test and functionality of septic tank (Post repair)

DO's – REPAIR & MAINTAINENCE OF SEPTIC TANKS

M4

Use PPE while doing repair and maintenance activities

The Septic Tanks should be emptied before doing any major repair and maintenance services

The repair and maintenance work to the tank should be done from outside

Clear the work area after completion of repair work

Inspection of the septic tank to be done regularly

DON'T'S – REPAIR & MAINTAINENCE OF SEPTIC TANKS

M4

Don't enter inside septic tank

Don't smoke near the septic tank

Don't use caustic drain openers for a clogged drain

SUMMARY

After completion of this training manual participants will be able to:

1. Repair and maintain the septic tanks as per the CPHEEP norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

QUIZ

Q.1. Please correct the process of Installation of a septic tank in ascending order?

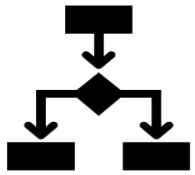
S. No.	Given order	Correct order
1	Excavation	
2	Joint seals	
3	Site condition	
4	Pre fabricated tank replacement	
5	Backfilling	
6	Bedding	

Name of Module

Module 5: MAINTAIN PERSONAL HEALTH AND SAFETY WHILE CONSTRUCTING A SEPTIC TANK

Theory

Practical



Outcomes

Outcome:

- Awareness about potential hazards during construction of septic tank/soak pit
- Awareness on mitigation of hazards during construction of septic tank/soak pit
- Awareness about potential hazards during repair work
- Awarenessss about mitigation of hazards during repair work

Data Source: NSDC Septic Tank Technician Model Curriculum (www.nsdc.org) Icons Source: www.flaticon.com

TRAINING MODULES

M5

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

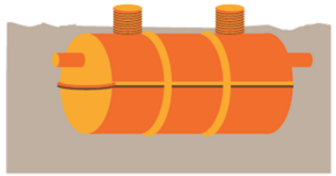
1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

2 EXCAVATION AND CONSTRUCTION OF SEPTIC TANK / SOAK PIT

Outcome:

1. Marking of the layout of the septic tanks
2. Excavation the site
3. Construction the septic tanks
4. Dos and Don'ts in the construction of septic tanks

3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Awareness about types of prefabricated septic tanks
2. Awareness about types and process of installation
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY WHILE CONSTRUCTING A SEPTIC TANK

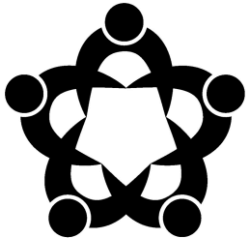
Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS



Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

MODULE 5

OUTCOME

STEP 1 - Awareness about potential hazards during construction of septic tank/soak pit

STEP 2 - Awareness on mitigation of hazards during construction of septic tank/soak pit

STEP 3 - Awareness about potential hazards during repair work

STEP 4 - Awarenessss about mitigation of hazards during repair work

STEP 1- POTENTIAL HAZARDS DURING CONSTRUCTION

PHYSICAL HAZARDS

- Collapse of septic tank or pit wall
- Slips, trips and falls
- Exposure to sharp objects like glass, metal, blade, etc.
- Any other accident particularly during traveling

ELECTRICAL HAZARDS

Electric shock due to use of drill machine or other masonry equipment's

STEP 2 – MITIGATING PHYSICAL HAZARDS

PERSONAL PROTECTIVE EQUIPMENTS

Mandatory to wear PPE to avoid any kind of hazard while carrying out de-sludging services and to avoid direct contact with faecal sludge

TRAINING PROGRAMS

Training programs on health and safety measures, Usage of PPE and First Aid

MEDICAL CHECK UPS AND IMMUNIZATION

De-sludging operator should be immunized for Tetanus, Hepatitis A and Diphtheria on a regular basis

STEP 2- PERSONAL PROTECTIVE EQUIPMENT

M5

HELMET

GUM BOOTS

HAND GLOVES

SAFETY GOGGLES

REFLECTIVE VEST

SAFETY TORCH

APRON

STEP 2 – MAINTAINENCE OF PPE

- Clean PPE with soap and hot water after each use and store properly.
- Clean contaminated work clothing daily.
- Eat in designated areas away from work area and removed all PPE before eating
- Store PPE away from eating and food storage areas.

STEP 2- FIRST AID BOX COMPONENTS

M5

First aid chart
Chart details out the use of the first aid box in an emergency.

Medical plasters
Elastic bandages are used without the need for dressing injured area

Medical gauze
Small, medium and large sterile gauze dressings

BANDAGES: These bandages are used to hold the dressing on a wound.

Distilled water
For cleaning wounds

Sterile gloves
These gloves are used in medical examination

Scissors
The scissors are used in cutting of bandages, gauze and injured area

Cleansing wipes
The wipes are used in the cleaning of the wound

Antiseptic cream
Used for Skin rash, spray to relieve insect bites and stings

Ointment for burns
Used in case of burns on skin

Soap
Handwash before and after desludging activities

STEP 2 - MITIGATING ELECTRIC HAZARDS

The danger from an electrical shock depends on the type of current, how high the voltage is, how the current travelled through the body.

Symptoms of Electric shock are:

- Severe burns
- Confusion
- Difficulty breathing
- Heart rhythm problems
- Cardiac arrest
- Muscle pain and contractions
- Seizures
- Loss of consciousness

Don't touch the injured person if he or she is still in contact with the electrical current.

Turn off the source of electricity

Call ambulance

STEP 3 – POTENTIAL HAZARDS DURING REPAIR WORK

BIOLOGICAL HAZARDS

A large number of coliform groups, various kinds of pathogen, and egg parasites exist in the septic tank. These pathogens can cause a number of diseases such as jaundice, worm infestation, infection, typhoid etc.

EXPLOSIVE/FLAMMABLE GASES

Exposure to flammable gases from septic tank like, Methane and Carbon dioxide

FIRE

Fire can occur in septic tanks due to methane gas during high temperature

STEP 4 – MITIGATING BIOLOGICAL HAZARDS

Presence of pathogens, bacteria and viruses in septic tank, can cause infections and in some cases snake bites, hence following precaution should be taken:

Take effective immunization for Tetanus, Hepatitis A and Diphtheria, Typhoid, Cholera, etc. on a regular basis

Use rubber hand gloves and cover skin with barrier cream

After the work is completed, thoroughly wash hands with antiseptic soap

In case of any cuts or wounds, use bandage and antiseptic cream to cover the wound and prevent further infection

STEP 4 – MITIGATING GASEOUS HAZARDS

Exposure to flammable gases from septic tank like, Methane and Carbon dioxide can cause breathing problems, nausea or asthma

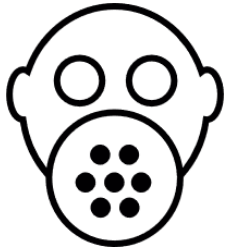
Following shall not be allowed near septic tank:

SMOKING

OPEN FLAMES

SPARK

In case of gas emergency,



WEAR BREATHING MASK

ERECT WARNING SIGNS

STEP 4 – MITIGATING FIRE HAZARDS

Presence of chemicals and the flammable nature of methane gas in present in septic tank, can be the cause of fire

Type of Fire that can be caused at the septic tank site: **Class C**
Source of origin: Fires involving flammable gases under pressure including liquefied gases, where it is necessary to inhibit the burning gas at fast rate with an inert gas, powder or vaporizing liquid for extinguishment.

Dry Powder

Clean Agent

Carbon Dioxide

DO's – MAINTAIN PERSONAL HEALTH AND SAFETY

Use and maintain Personal Protective Equipment

Always keep a First aid box

Place boards/caution signs such as "Work in progress" or "Danger" to avoid accidents

Use fire extinguisher whenever required

DON’T’S – MAINTAIN PERSONAL HEALTH & SAFETY

M5

Don’t smoke or lit flames near septic tank

SUMMARY

After completion of this training manual participants will:

1. Get aware about potential hazards during construction of septic tank/soak pit
2. Get aware about mitigation of hazards during construction of septic tank/soak pit
3. Get aware about potential hazards during repair work
4. Get aware about mitigation of hazards during repair work

EXERCISES

Instructions for Trainer:

1. Divide participants in 3-4 groups
2. Ask them to list down or explain the answers to the given questions.

Group 1:

List down or explain do's & dont's to mitigate biological, gaseous, fire & electrical hazards

Group 2:

Give them PPE and ask them the following questions

- How does this protect you?
- Do you need any training to use this PPE?
- What kind of hazard might be avoided through this PPE?
- Why might you not want to wear this while working?

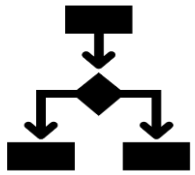
EXERCISE – SPOT THE HAZARD

Name of Module

Module 6: WORKING EFFECTIVELY WITH OTHERS

Theory

Practical



Outcomes

Outcome:

- Awareness about potential hazards during construction of septic tank/soak pit
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- Awareness about potential hazards during repair work
- Awarenessss about mitigation of hazards during repair work

Data Source: NSDC Septic Tank Technician Model Curriculum (www.nsdc.org) Icons Source: www.flaticon.com

TRAINING MODULES

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

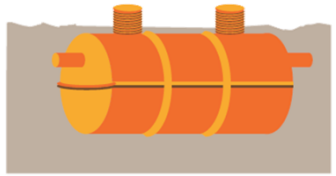
1. Location and Assessment of site of septic tank
2. Various design of a septic tank
3. Estimation and material needed for construction
4. Tools required for operations

2 EXCAVATION, FABRICATION AND INSTALLATION OF SEPTIC TANK / SOAK PIT

Outcome:

1. Marking of the layout of the septic tanks
2. Excavation the site
3. Construction the septic tanks
4. Dos and Don'ts in the construction of septic tanks

3 INSTALLATION OF PREFABRICATED SEPTIC TANK



Outcome:

1. Installation the prefabricated septic tanks
2. Demonstrate the working principle of prefabricated septic tanks
3. Do's and Don'ts while installing the prefabricated septic tank

4 REPAIR AND MAINTENANCE OF SEPTIC TANK /SOAK PIT

Outcome:

1. Repair and maintain the septic tanks as per the CPHEEO norms
2. Test the functionality of septic tanks post repair
3. Diagnose the issues of the septic tank
4. Dos and Don'ts while repairing the septic tanks

5 MAINTAIN PERSONAL HEALTH & SAFETY

Outcome:

1. Awareness about potential hazards
2. Awareness on how to handle the construction equipment safely
3. Awareness about using First Aid
4. Awareness on maintaining occupational health and safety

Source: NSDC Septic Tank Technician Model Curriculum (www.nsdc.org) Icons Source: www.flaticon.com

TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS

Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

MODULE 6 – WORKING EFFECTIVELY WITH OTHERS

OUTCOME

STEP 1 – Understand about work ethics & etiquettes

STEP 2- Information & data security rules

STEP 3 – Aspects for diversity & inclusiveness at workplace

STEP 4 – Characteristics required to work effectively with others

STEP 5 – Expression of problems with the appropriate authority

STEP 1 - WORK ETHICS AND ETIQUETTES

The following are the work ethics and etiquettes to be considered in addition to professional duties

Properly and consciously operate desludging services & equipment following the safety measures

Always consider personal safety, the safety of fellow workers and customers while working

Properly and accurately fill record books and/or make reports

Avoid unprofessional activities

STEP 2 - INFORMATION AND DATA SECURITY RULES

M6

It is crucial to keep certain data confidential and the kind of data which needs to be shared publicly.

Following are the information which you should share only with your senior

Employee details like, name, contact details, pay scale, etc.

Financial information

Following are the information which can be shared with the public

Brochures & flyers giving information about your work or company

Advertorials as news stories & reviews on newspaper

Newsletters to keep public informed about your desludging services or operations

STEP 3 - DIVERSITY AT INCLUSION AT WORKPLACE

Following are the elements required to maintain diversity and inclusion at workplace, so the employees experience:

- Fairness and respect
- Value and belongingness
- Safe and open
- Empowered and growing

STEP 4 - WORKING EFFECTIVELY WITH OTHERS

Since you will be working mostly in teams it is very important to develop good habits to work effectively with co-workers

Following characteristics are required to work effectively with co-workers:

- Be honest and straight forward
- Share the work load equally & assist others
- Treat others with respect and dignity
- Be an active listener and speak with discretion
- Acknowledge contribution of your team members

STEP 5 - HOW TO EXPRESS PROBLEMS TO APPROPRIATE AUTHORITY

Problems or Grievances are basically a feeling of resentment or discontent which can be against a supervisor, co-worker, machine, equipment, about the environment, against workload etc.

Following is the general outline of a typical grievance process:

1. Express your problem with your immediate supervisor either verbally or in writing
2. Your supervisor can deal with the grievance/problem on his own or pass it on to the higher authority
3. Conduct a formal meeting with the authority to discuss and resolve the issue
4. Gather information & data to investigate the situation
5. While reviewing the issue keep in mind the benefit of your co-workers

SUMMARY

This training module gives information on:

1. The importance and the correct way of working effectively with co-workers
2. Importance of diversity and inclusion in an organization
3. Best practices for a diverse and inclusive work culture
4. Procedure for addressing grievances.

QUIZ

Please answer the following question

1. What are the four key elements of inclusive workspace?

Please answer the following question

1. What is a grievance?

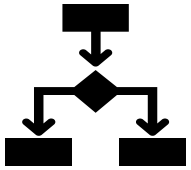
Answer True or False	
Laborer reports directly to his/her supervisor	
Smoking is allowed while working	
Financial information can be shared publicly	
Do not inform anyone if you feel discriminated	

Name of Module

Module 7: EMPLOYABILITY & ENTREPRENEURHSIP SKILLS

Theory

Practical



Outcomes

1. Understand about digital literacy
2. Understand about money related components
3. Understanding about entrepreneurship

TRAINING MODULES

M7

1 ASSESSMENT OF SITE & SIZE OF SEPTIC TANK/SOAK PIT

Outcome:

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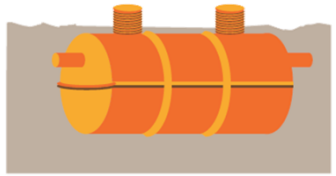

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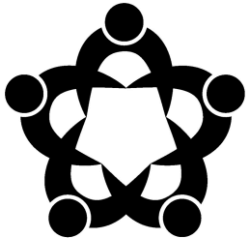
TRAINING MODULES

6 WORKING EFFECTIVELY WITH OTHERS



Outcome:

- The importance and the correct way of working effectively with co-workers
- Importance of diversity and inclusion
- Procedure for addressing grievances.

7 EMPLOYABILITY & ENTREPRENUERSHIP SKILLS

Outcome:

- Understand about digital literacy
- Understand about money related components
- Understanding about entrepreneurship

MODULE 7 - EMPLOYABILITY & ENTREPRENEURHSIP SKILLS

M7

OUTCOME

STEP 1 – Understand about digital literacy

STEP 2 – Understand about money related components

STEP 3 – Understand entrepreneurship

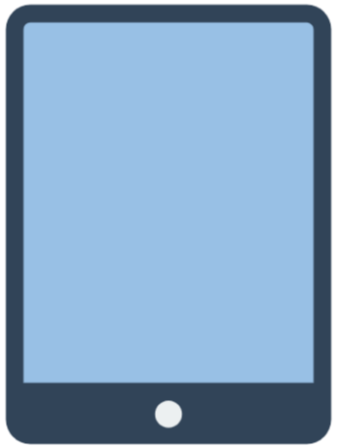
STEP 1 – DIGITAL LITERACY

M7

Following are the types of electronic devices:

Smart phone

Computer



Tablet

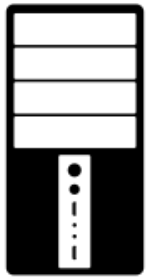
Laptop

www.vectorstock.com
www.icons.com
www.vecteezy.com

STEP 1 – DIGITAL LITERACY

M7

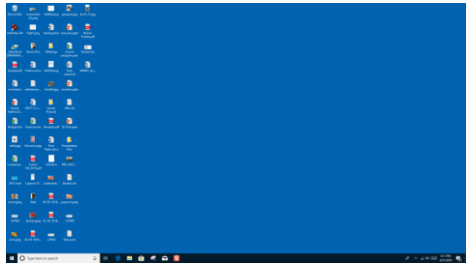
Basic parts of a computer



Central Processing Unit (CPU)
The brain of the computer. It interprets and carries out program instructions

Hard Drive
A device that stores large amounts of data

Monitor
The device that contains the computer screen where the information is visually displayed



Desktop
The first screen displayed after the operating system loads

Mouse
A hand-held device used to point to items on the monitor

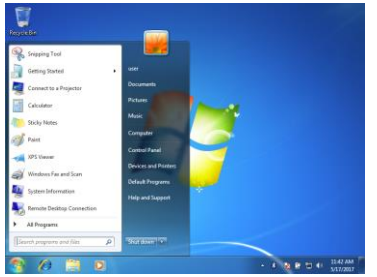
Printer
A device that converts output from a computer into printed paper documents

STEP 1 – DIGITAL LITERACY

M7

Icon
A small picture or image that visually represents something on your computer

Cursor
An arrow which indicates where you are positioned on the screen



Program Menu
A list of programs on your computer that can be accessed from the Start menu

Taskbar
The horizontal bar at the bottom of the computer screen that lists applications that are currently in use.

Recycle Bin
A temporary storage for deleted files

STEP 2 – MONEY MATTERS

Why should one save money?

Saving money steadily through the years is so important, it will help improve your financial situation over time.

Inculcating the habit of saving leads to a vast number of benefits. Saving helps you:

Become financially independent	**Pay for emergencies**	**Afford large purchases**
Be prepared for surprise expenses	**Get out of debt**	**Invest in yourself through education**

STEP 2 – MONEY MATTERS

M7

Process for opening a bank account

Step 1: Fill in the Account Opening Form

This form requires you to provide the following information:

- Personal details Method of receiving your account statement
- Details of your initial deposit
- Manner of operating your account
- Ensure that you sign wherever required on the form.

Step 2: Affix your Photograph

Stick a recent photograph of yourself in the allotted space on the form.

Step 3: Provide your Know Your Customer (KYC) Details

- KYC is a process that helps banks verify the identity and address of their customers.
- To open an account, every individual need to submit certain approved documents with respect to photo identity (ID) and address proof.

Step 4: Submit All your Documents

- Submit the completed Account Opening Form and KYC documents.
- Then wait until the forms are processed and your account has been opened

Who is an Entrepreneur?

Anyone who is determined to start a business, no matter what the risk, is an entrepreneur.

STEP 3 – UNDERSTANDING ENTREPRENUERSHIP

As an entrepreneur in India, you can own and run any of the following types of enterprises:

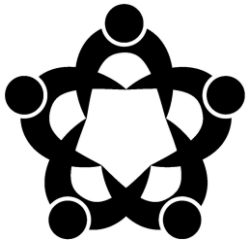
1 **Sole Proprietorship**
In a sole proprietorship, a single individual owns, manages and controls the enterprise

2 **Partnership**
A partnership firm is formed by two or more people. The owners of the enterprise are called partners

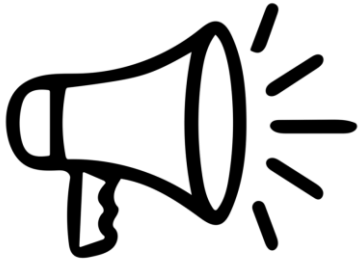
3 **Limited Liability Partnership (LLP)**
In a Limited Liability Partnership or LLP, the partners of the firm enjoy perpetual existence as well as the advantage of limited liability.

STEP 3 – UNDERSTANDING ENTREPRENUERSHIP

An entrepreneur requires a certain set of qualities or skills to run their enterprises successfully



Leadership and team work



Effective communication skills

Problem solving & negotiation skills

Skills to identify business opportunities

Developing network with various stakeholders

www.PNGitem.com
Iconlibrary.com
thenounproject.com
www.allfreedownload.com
www.shutterstock.com

STEP 3 – UNDERSTANDING THE ENTREPRENUERSHIP

Every entrepreneur requires a business plan before starting their own enterprise or business.

Why Create a Business Plan?

A business plan is a tool for understanding how your business is put together. It can be used to monitor progress, foster accountable and control the fate of the business

The following are the elements to be considered for developing a business plan:

KEY PARTNERS
Who are your key partners/suppliers?

KEY ACTIVITIES
What key activities does your value proposition require?

VALUE PROPOSITION
What core value do you deliver to the customer?

CUSTOMER RELATIONSHIP
What relationship that the target customer expects you to establish?

CUSTOMER SEGMENT
For which customers are you creating your business for?

KEY RESOURCE
What key resources does your value proposition require?

DISTRIBUTION CHANNEL
Through which channels that your customers will be reached?

COST STRUCTURE
What are the most cost in your business?

REVENUE STREAMS
What are your various revenue channels?

SUMMARY

This training module gives information on:

1. Understanding digital literacy

2. Understanding financial literacy

3. Understanding entrepreneurship skills required and components of a business plan.

QUIZ

Please answer the following question

1. Steps for opening a bank account

Please answer the following question

1. List the skills required to become a entrepreneur

Please answer the following question

1. Components of a business plan