

Accident Awareness and Loss Prevention for Sewer Related Tools & Tasks

A man wearing an orange hard hat, safety glasses, and a high-visibility yellow vest over a grey shirt is smiling and gesturing with his hands. He is standing next to a presentation slide. The slide has a yellow background and a blue header with the NEZAT logo. The slide content includes the title 'Objectives', a paragraph about providing high-level information to operators, and a list of five objectives with corresponding icons: Safety (person icon), Chassis (gears icon), Patented Hydrostatic System (document icon), High Pressure Water System (water drop icon), and Vacuum System (vacuum pump icon).

Objectives

These objectives are to provide operators with high level information to gain an understanding of the ECO 900.

- Safety
- Chassis
- Patented Hydrostatic System
- High Pressure Water System
- Vacuum System



Presented by: Malvin “Rusty” Nezat
Director of Nezat Training and Consulting, Inc.



A Little Bit About Me...

- In the industry for over 40 years
- Providing training for 20 years
- Creator of multiple collection system training programs
- Holds 5 U.S. Patents related to large diameter sewer cleaning systems
- Dung Beetle Lover



#GuruOfPooPoo

Disclaimer

Multiple safety issues are briefly discussed in this presentation for the purpose of making the individual aware of potential threats to person or equipment if correct procedures or best practices are not adhered to. This program is in no way the complete assimilation of a safety program regard each of the topics.

Warning

Please be advised that some videos and photos included in this presentation contain graphic images of men injured while working in the storm water and wastewater industry.

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Save The Dung Beetle

Pneumatic Plugs

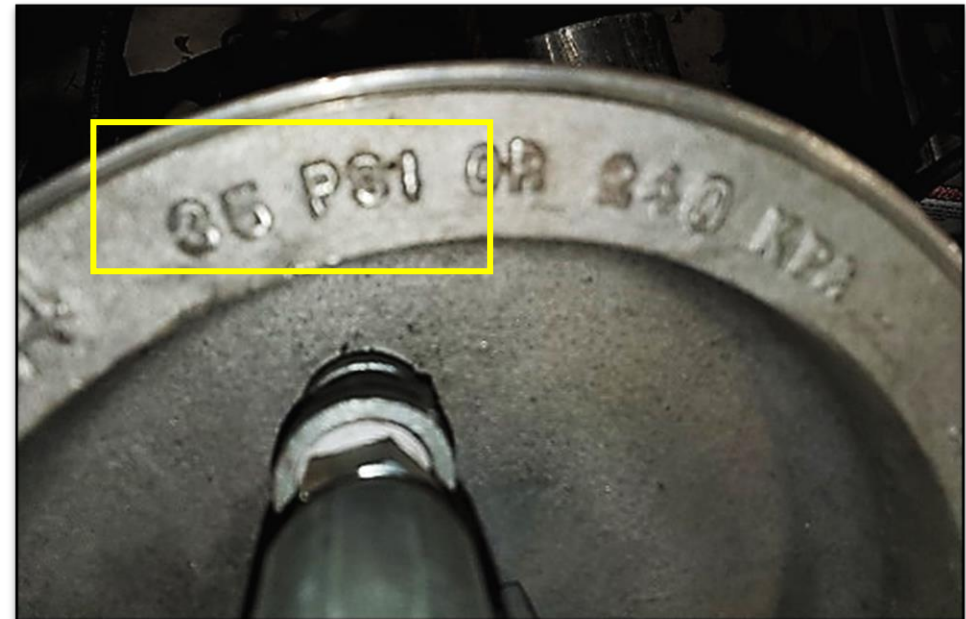


1. Pressures in the plug
2. Pressures behind the plug
3. Proper inflation apparatus

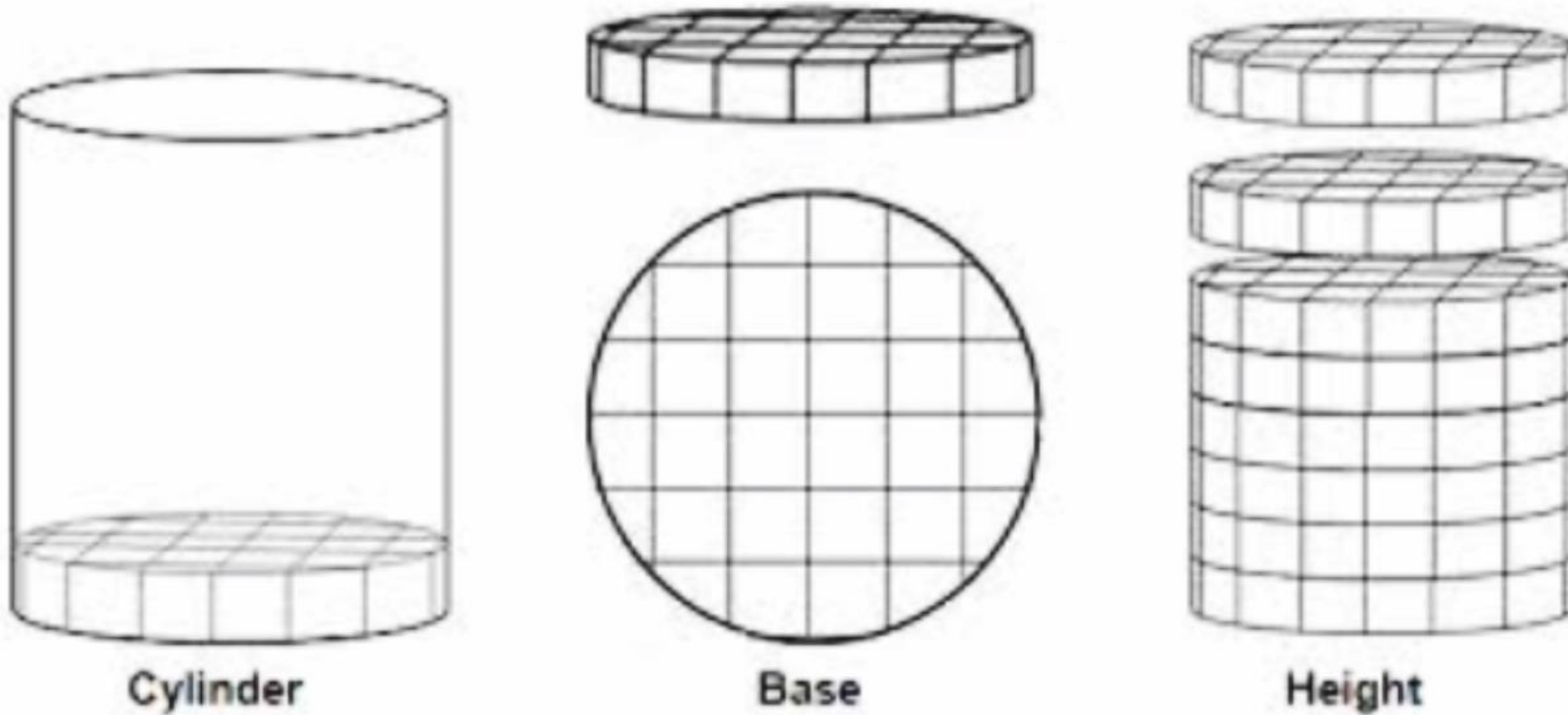
Pneumatic Plugs

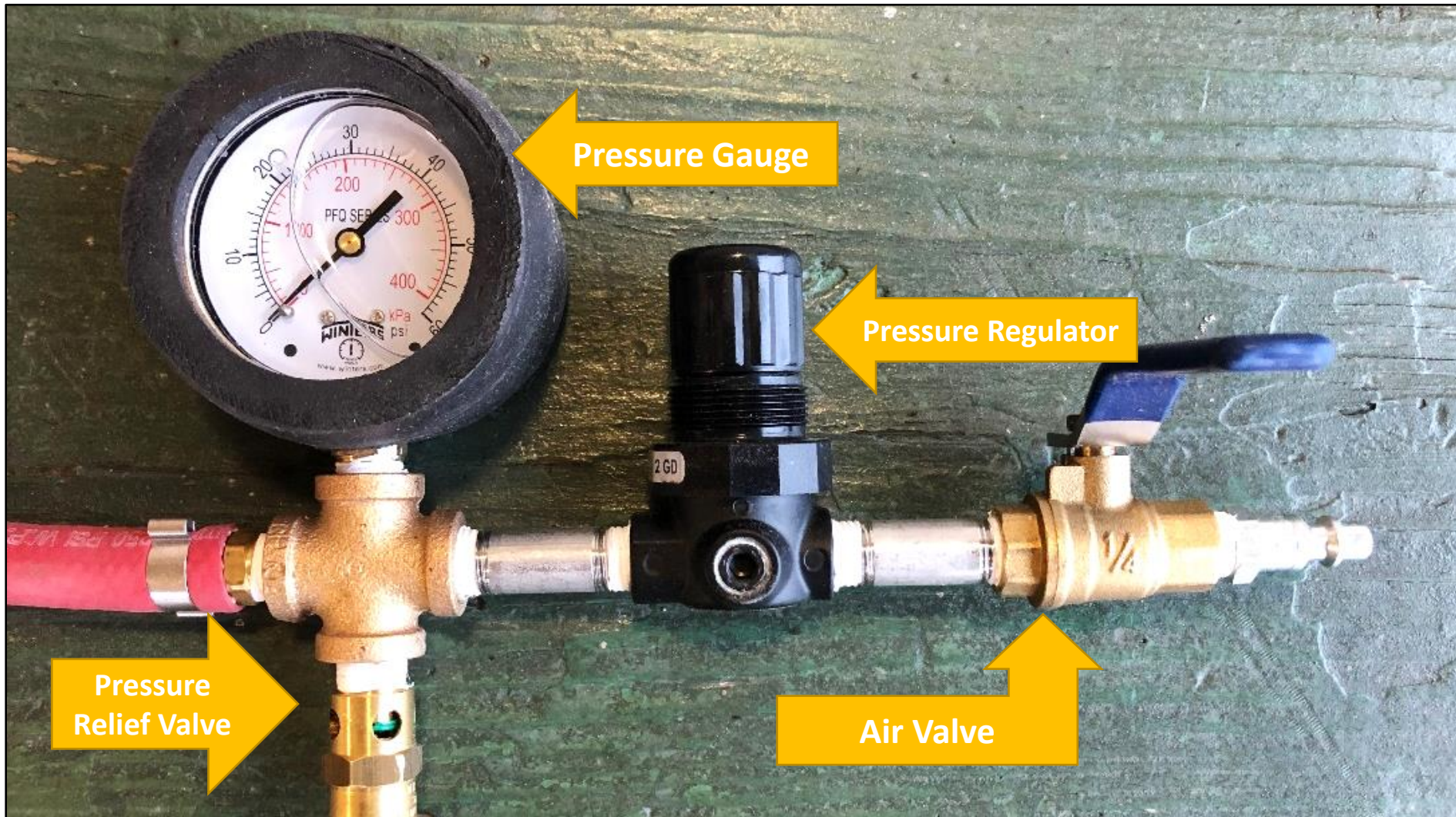


All plugs have pressure ratings.



Pneumatic Plugs





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Pipefitter/Project Foreman Died When Struck by Ruptured Sewer Pipe/Mechanical Plug

On March 30, 2007, a 53-year-old male pipefitter and project foreman for a mechanical contractor died when a storm sewer pipe and inflatable plug dislodged and struck him causing fatal injuries to his chest and abdomen.

Cause of Death

The cause of death as stated on the death certificate was multiple blunt injuries of chest and abdomen. Toxicology was negative for alcohol and illicit drugs.

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A 30-inch plug that
is fully inflated
contains
approximately
500,000 lbs. of
force!



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EXAMPLES OF "FORCE" ON A PLUG			
Diameter of Plug	Plug Surface Area	Water Level (Feet)	Force on Plug (Pounds)
4 inches	12.5 sq. inches	20	110
		15	82
		10	55
		5	27
8 inches	50.3 sq. inches	20	440
		15	330
		10	330
		5	110
16 inches	201 sq. inches	20	1,760
		15	1,320
		10	880
		5	440
32 inches	804 sq. inches	20	7,040
		15	5,280
		10	3,520
		5	1,760

Do not wrap the retaining rope around your arm or hand!



Construction worker dies after falling into
northeast Austin manhole.

How Did it Happen?

High-Pressure Sewer Hose



1. Hose protection
2. Hose splicing

Avoid High Pressure Fluids

- Escaping fluid under pressure can penetrate the skin, causing a serious hazard by relieving pressure before disconnecting hydraulic or other high-pressure lines. Tighten all connections before applying pressure.
- Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids. If accident occurs, seek immediate medical attention.
- Keep hands and body away from pinholes and nozzles which can eject fluids under high pressure.



Gloves



Exposed Reinforcement







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Manhole Ring Protectors



Registry of Inner Hose Colors To Identify Manufacturers of High Pressure Sewer Cleaning Hose

Color	Company Name
	Dayco (Predator)
	Parker (Predator & Paraflex)
	Piranha
	Aeroquip (Gator)
	Poly-Flow (Cobra)
	Dynaflex
	Scheiffer
	Synflex (Street King)

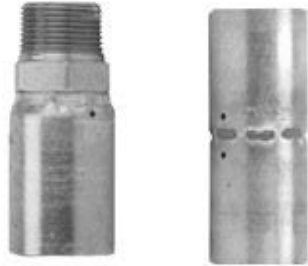


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Hose Mending

Hose Fittings

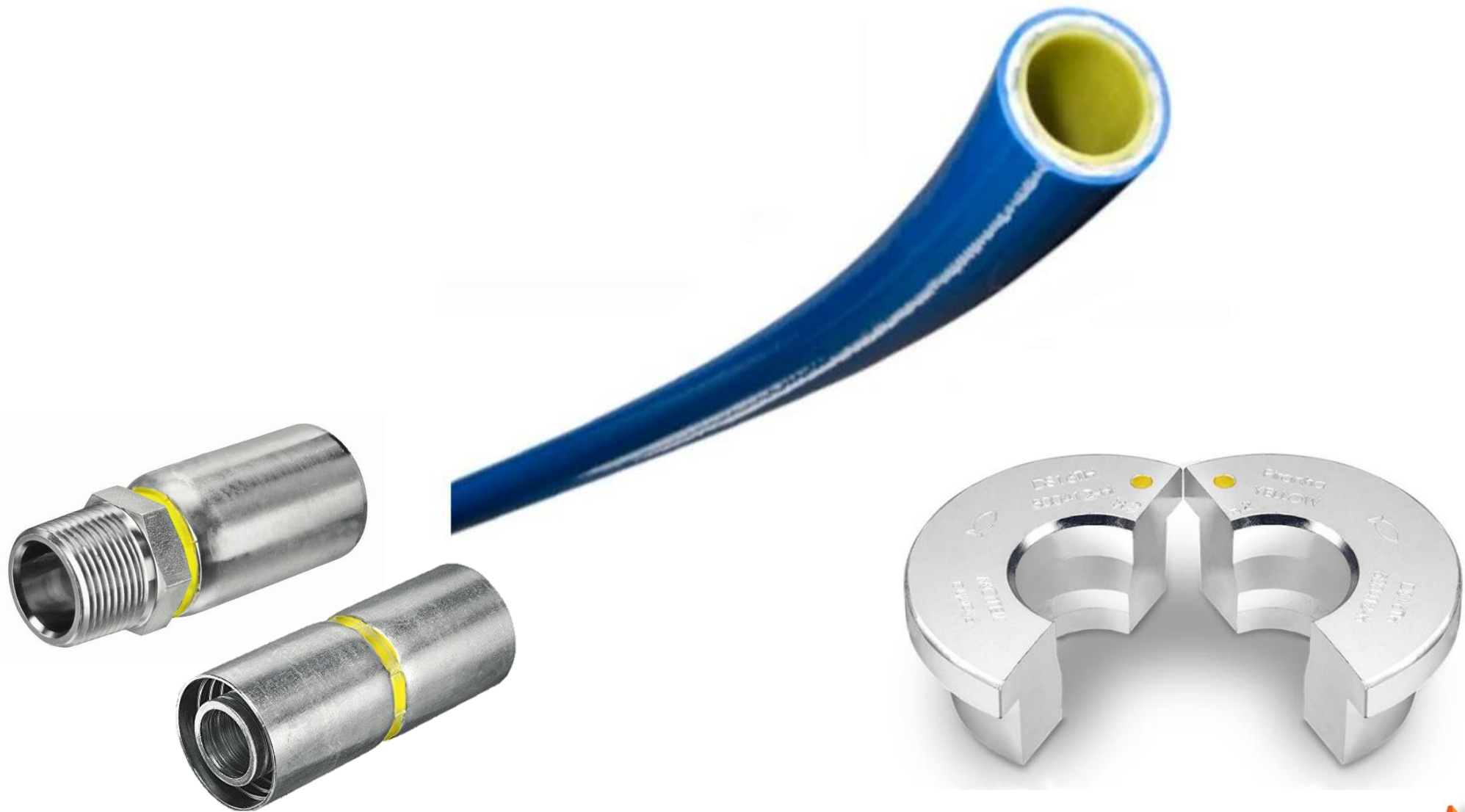


Swage Tools



Hose Pusher and Dies





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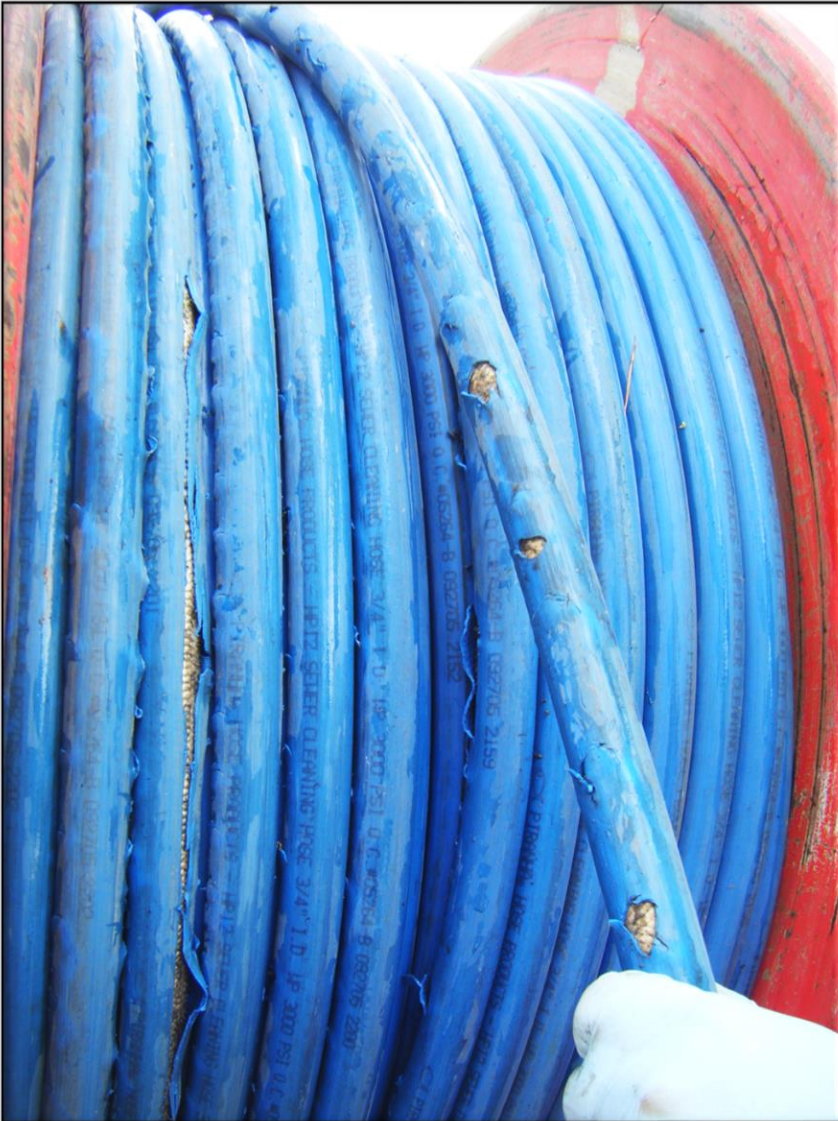


Hose Splicing

Training & Certification



If you did not make the
splice, you are putting
your life in someone
else's hands!



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To avoid this situation once the new hose has been installed, a line should be jetted at just enough pressure to move the nozzle forward up the line until all the hose has been paid out. Then, under high pressure, the hose should be retrieved and level wound back onto the reel.

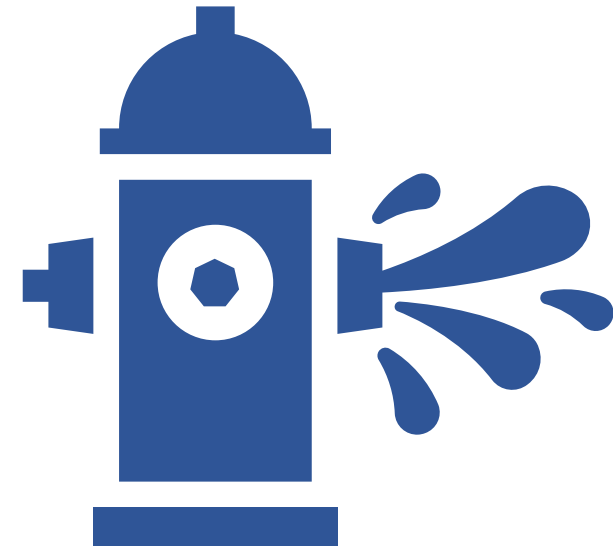
Dynamic Filling



1. How many times in a day do you fill up?
2. How many minutes of cleaning time a day?
3. Equipment needed for dynamic filling
4. Protection for road crossing

How much time are we ***ACTUALLY*** cleaning pipe per day?

- Cleaning pipe requires that the nozzle be traveling through the pipe.
- How many times per day does the crew fill with water on average?
- How many gallons of water can your unit contain?
- What is the displacement of your water pump?



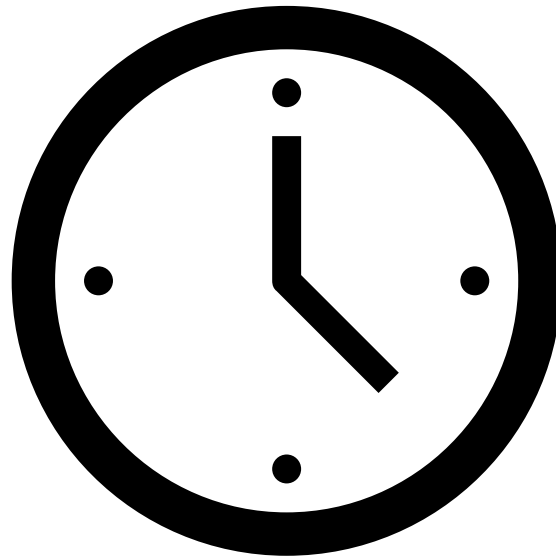
Actual Cleaning Time

- Unit water capacity is 1,000 Gallons
- Crew fills 5 times per day = 5,000 Gallons
- Pump displacement is 80 GPM



Actual Cleaning Time

62 Minutes



Benefits of Dynamic Filling



- Reduces the number of setups on a single manhole
- Increases production
- Improves the quality of cleaning
- Makes vacuum tank available for debris instead of potable water

When Can We Use Dynamic Filling?



Dynamic filling is used whenever one tank of water is not sufficient to clean the line and a fire hydrant is within 300 ft. of the unit.

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Dynamic Filling

Recommended Equipment



- 6 – 50 ft. Sections of 1.5-inch Mill Hose
- Hydrant adapters
- Water control valve mounted on unit
- 24 ft. of high-speed ramps system

Dynamic Filling

Filler Hose Protection

Whenever dynamic filling is used, sometimes it is necessary to lay filler hose across roadways. In order to protect the hose and vehicular traffic, ramps are deployed. Always use proper signage when laying filler hose across a roadway to alert traffic.



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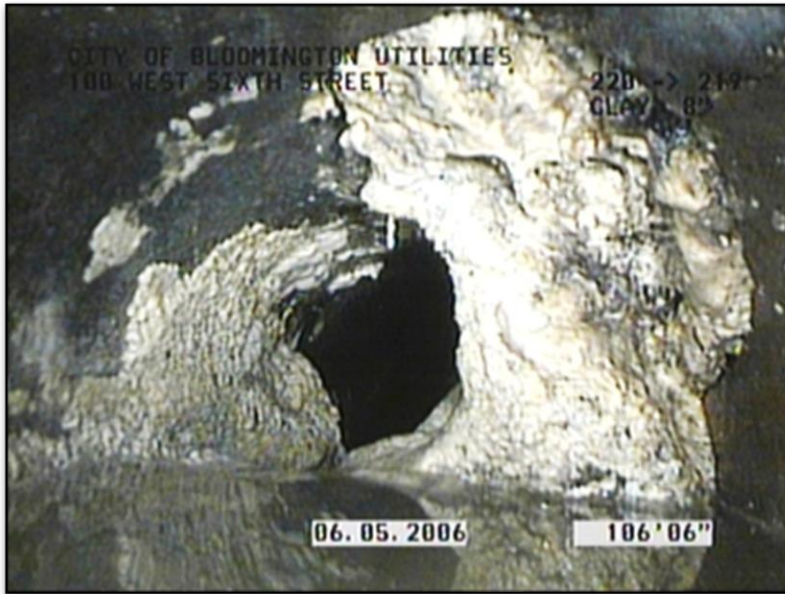
A photograph of two construction workers in high-visibility vests and hard hats working on a street corner. One worker is standing near a white fire hydrant, while the other is kneeling and installing a red plastic curb. Orange traffic cones are placed around the work area. The background shows a residential street with trees and a house.

**MADE FROM DURABLE URETHANE
WITH UV INHIBITORS**

Roots and Blockages



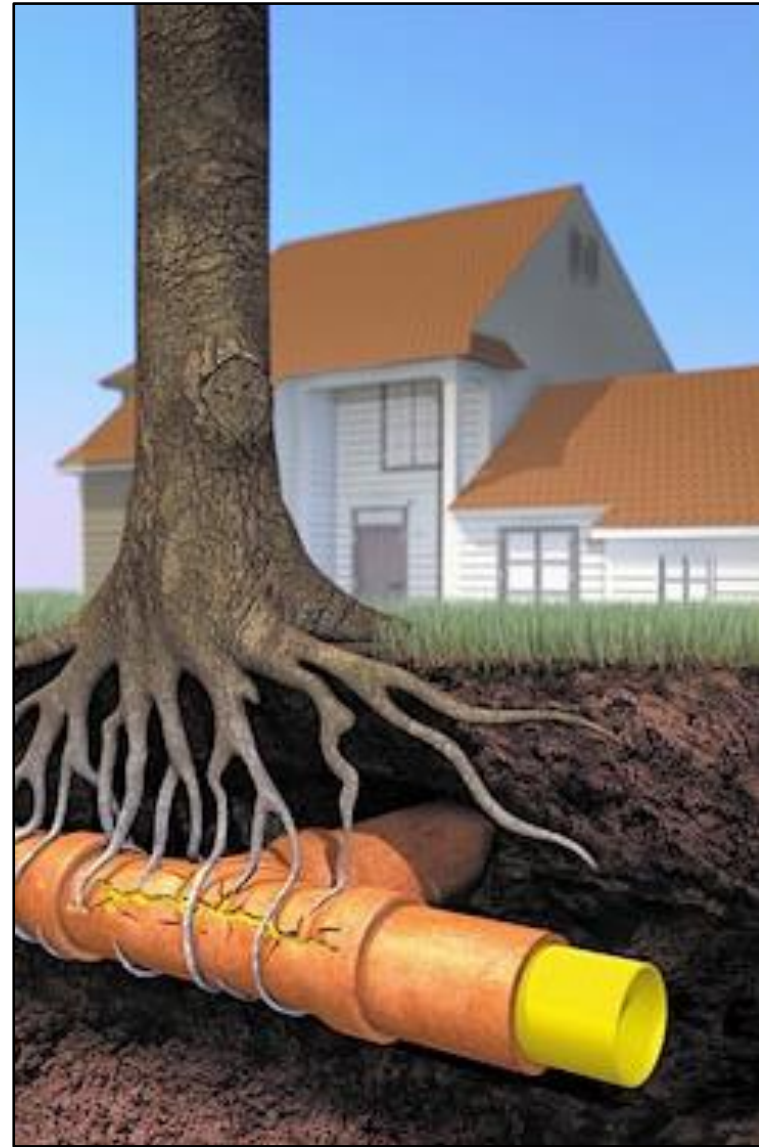
- Only jet out of a surcharged manhole as a last resort.
- Use an extension pole to ensure the nozzle is in the invert of the pipe.
- As soon as the blockage is penetrated, turn your pressure off.



Roots

How do roots grow in sewer pipes?

As trees and plants mature, their underground root system grows and naturally seeks out moisture. The most consistent source of moisture is sewer and wastewater pipelines. Joints and cracks in the pipe create natural entry points for roots. Roots start to grow at the top of the pipe and spread.



Blockages

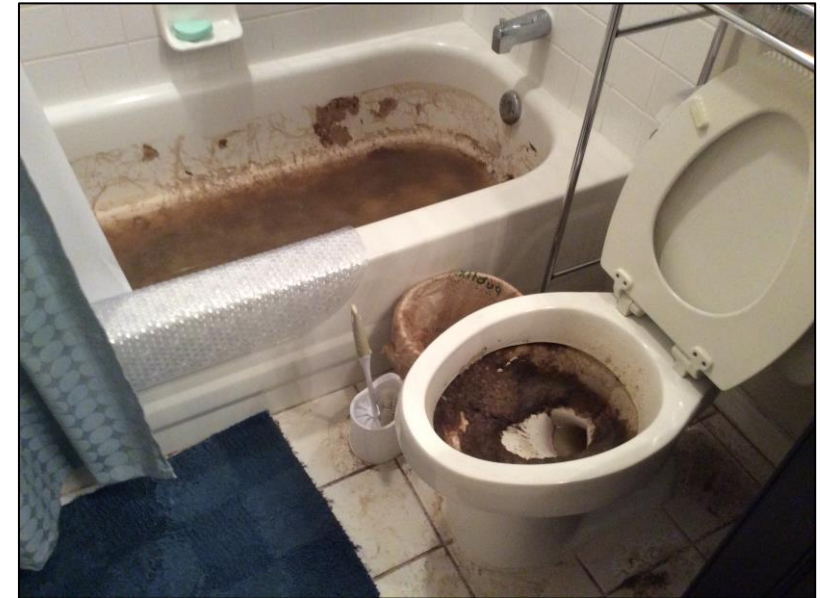
How can you relieve a blockage?

Once a surcharged manhole has been identified, setup the cleaning unit on the downstream manhole, if possible. Insert a 15-degree penetrating nozzle with nozzle extension into the line, then advance the nozzle until the blockage is reached. Note the footage on the hose reel counter. Penetrate the blockage, then allow the surcharged sewer to drain.



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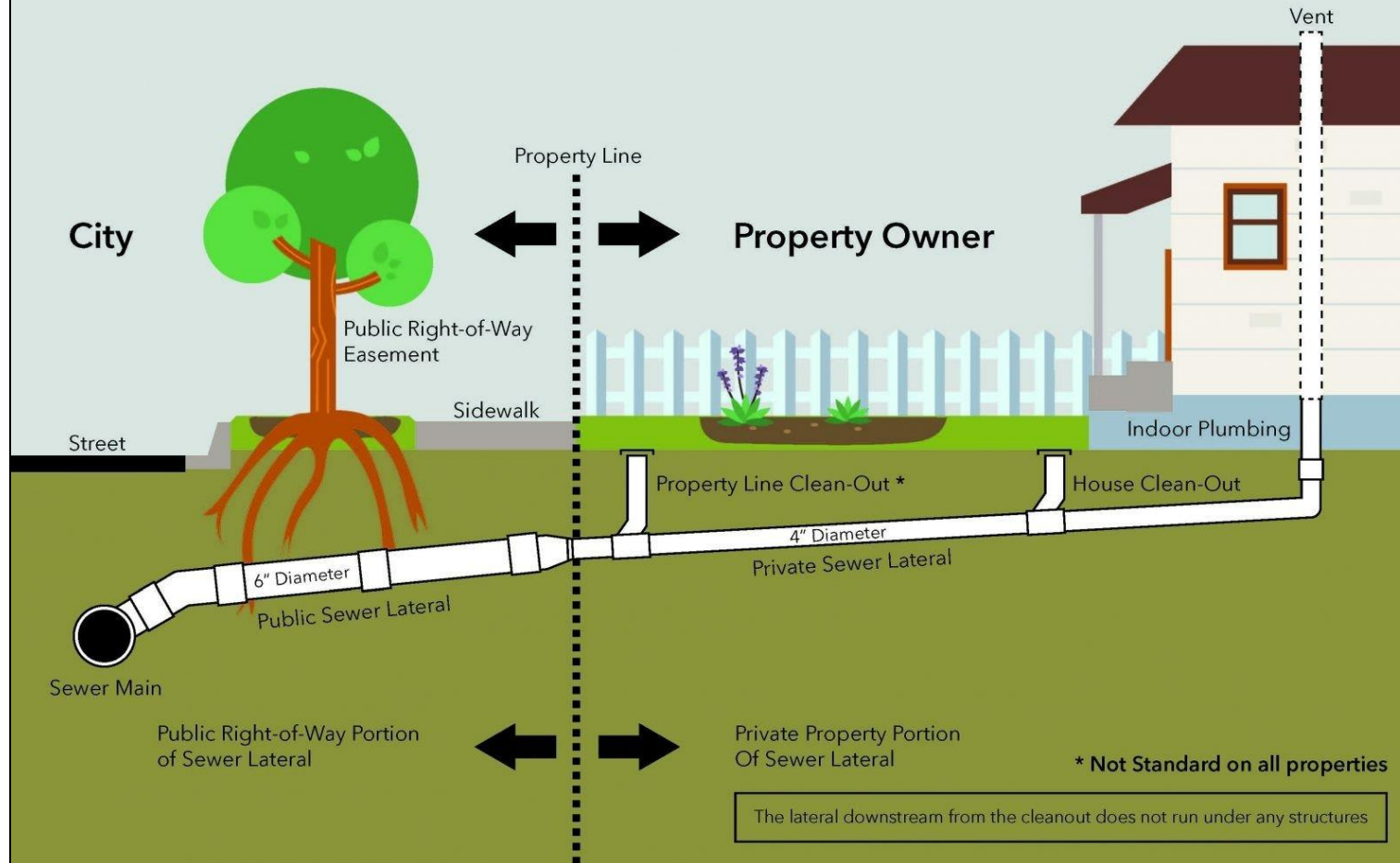
Use a pole with
attached magnet to
ensure the nozzle is
going into the pipe.

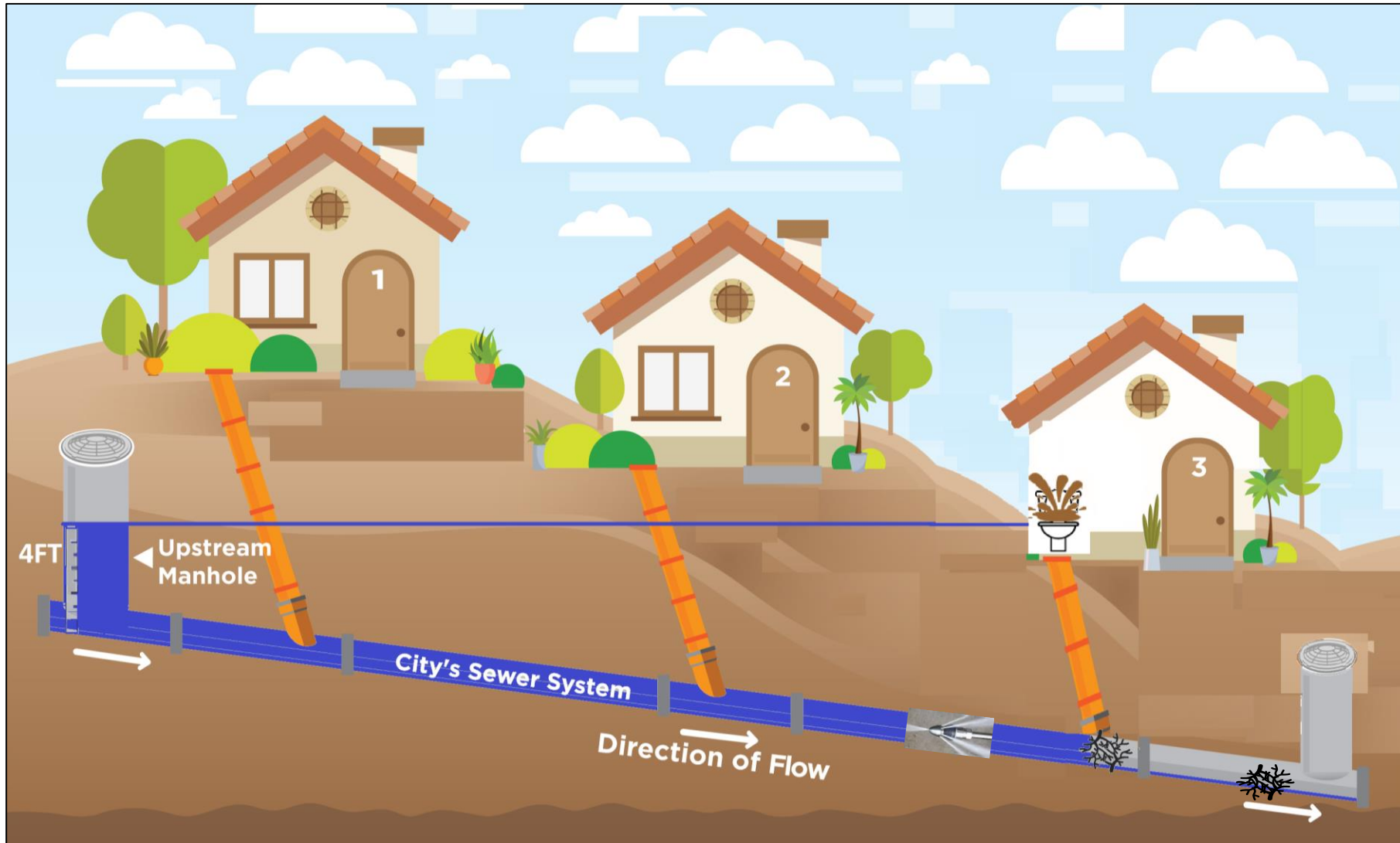




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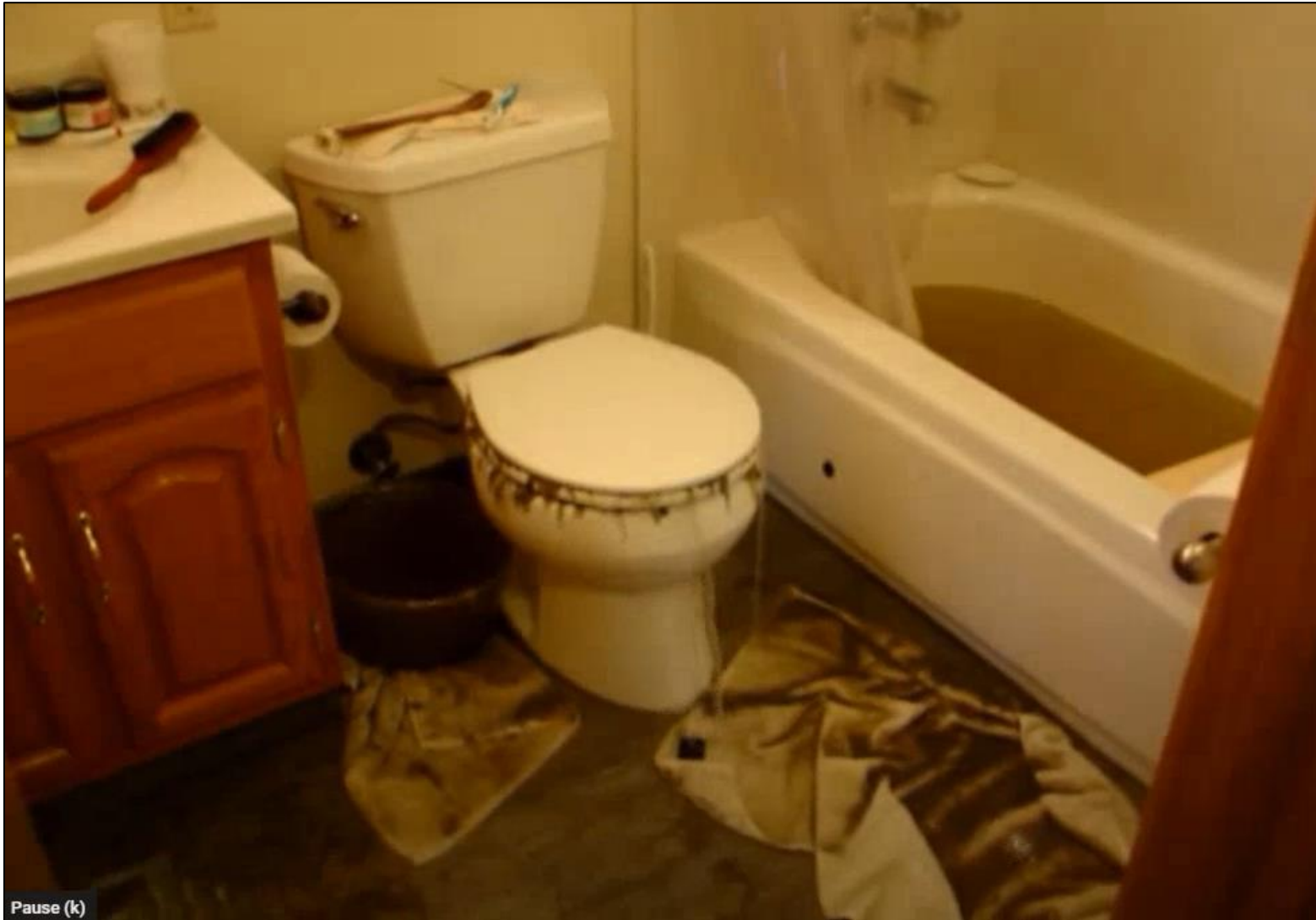




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Pause (k)



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Sewer Worker Killed by Nozzle

On August 6, 1999, a 29-year-old male public works employee died when he was struck by the nozzle of a high-pressure water hose.

Two employees were doing routine cleaning of the sanitary sewer line using a combination jet/vac truck equipped with a water-powered hose and nozzle. The nozzle somehow came back up through the manhole and struck the victim in the head.

Don't let this happen to you!



Safety Issues

Texting & Phones



Safety Issues

Texting & Phones



Safety Issues

Proper Barricading



Safety Issues



Pit Cleaning Safety Issues



Develop a protocol that would address the situation if an employee, pedestrian, or small animal were to fall into the opening...

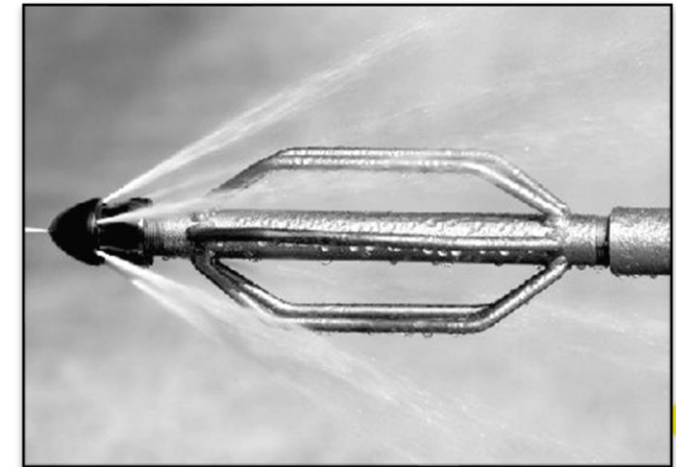
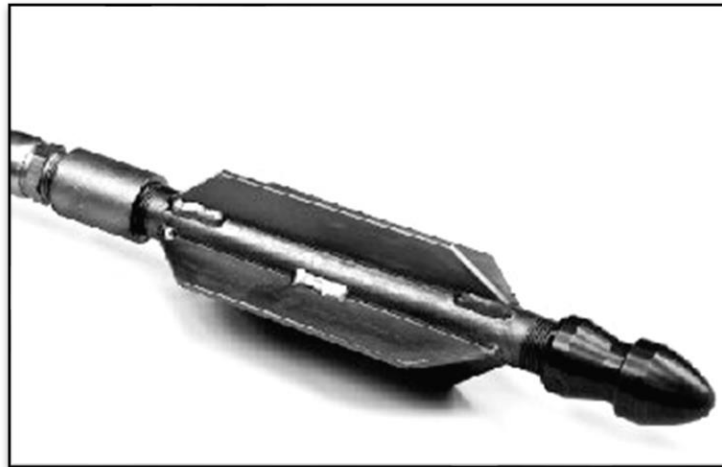


Nozzle Extensions

- Adds weight to the nozzle
- Prevents the nozzle from changing direction in the pipe
- Prevents the nozzle from entering laterals

Finned Nozzle Extension

- Centers the nozzle in the pipe, making it more effective
- Prolongs the life of the nozzle body



Hose Reducer



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Handgun



Winterization Sequence

Before you begin to winterize the unit, try to place the unit away from pedestrian walkways due to the possibility of water freezing and someone slipping on the ice.



Cold Weather Pump Startup



During freezing weather ice can form inside components and hoses of the high-pressure water system. The water traveling through the system will quickly raise the temperature of the piping above freezing.

The initial surge of water exiting the sewer hose may contain ice crystals that have accumulated and upon exiting the hose, this discharge can be extremely violent.

Cold Weather Pump Startup

Injuries have been suffered as ice exiting the hose stuck the operator in the body.



Cold Weather Pump Startup



Recommended procedure to avoid ice related injury.

Remove the end of the sewer hose from the travel connection. Using 3 heavy duty tie straps, lace the end of the sewer hose to adjacent hose raps to prevent the end of the hose from moving.

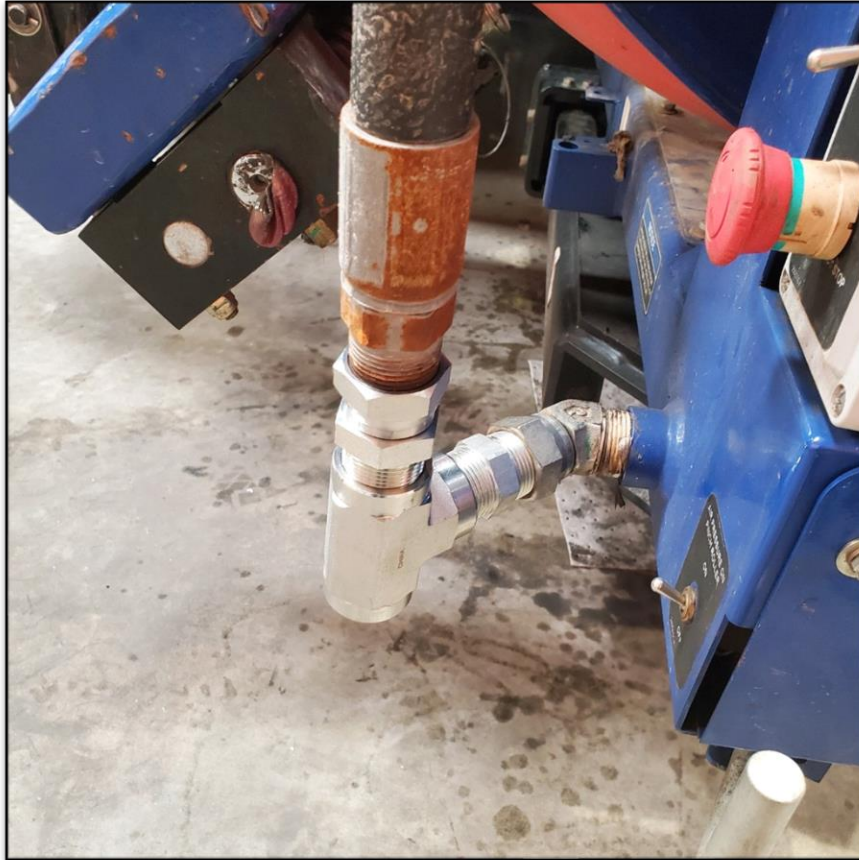
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Cold Weather Pump Startup



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