

TOWN OF VIENNA, VIRGINIA SAFETY MANUAL	Effective Date: August 8, 2011
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<i>Chapter 8: Sewer Back-Up Prevention and Procedures</i>	

8.1 SEWER BACK-UP PREVENTION

A. Purpose

This program has been developed in an effort to reduce the number of sewer back-ups and minimize both the anguish and expense associated with sewer back-ups. These efforts should aid the Town in complying with applicable regulatory guidelines and reducing the number and severity of sewer back-ups.

B. Policy Statement

The Town of Vienna believes that a prompt, effective response to sewer back-ups is an essential element of its overall objective to provide efficient and effective services to the community. To this end, management will provide the leadership, commitment, support, and resources necessary to implement and maintain the Sewer Back-up Prevention Program. Regardless of where and why back-ups occur, the Town will advise the parties involved as to their responsibilities and provide suggestions as to who to contact and how they should handle needed repairs and cleanup. If it is determined that the blockage originated in the main lines, the Town will respond in accordance with all applicable laws, policies and practices.

C. Introduction

Sewer back-ups create a stressful and emotional situation to all affected parties. Potentially, they may cause health and safety exposures as well as significant property loss. Proper responses to sewer back-ups can minimize losses from negative health effects and property damages, as well as help protect the assets and reputation of the entity. Each situation will be unique and may require slightly different responses. However, there are universal principles that may be applied to all situations.

The best risk management practice for sewer back-ups is to **prevent them from occurring**. Even in the best-run system, back-ups will occur – the goal then becomes **containment**. Therefore, good risk management control encompasses two primary goals:

Prevention - establishes **pro-active** policies and procedures designed to reduce the frequency of occurrences.

Containment - accomplished by establishing policies and procedures to minimize cost, conserve assets and protect the reputation of the Town.

D. Prevention

The Town has a duty to use reasonable care in maintaining its sewers. In litigation resulting from a sewer back-up, the court will decide whether the Town did or did not use reasonable care. Sovereign immunity can be forfeited by failure to exercise reasonable care. Even in well-managed organizations, back-ups may occur because of improper actions of users, vandalism, and infiltration of sand/silt, root growth or unforeseeable sewer line problems.

A. Evaluation and Identification of Exposures

1. Frequency of sewer line maintenance will be determined, based on actual experience. Chronic problem areas where grease, debris, roots, etc. have caused back-ups should be identified. These areas will be cleaned twice a year for the first year and if there are no further problems, they will be cleaned once the second year and return to the normal schedule the third year. Management and field supervisors should meet periodically to develop action plans to prevent recurring back-up problems.
2. Based on manpower, size of system and capability of equipment, establish an overall goal of cleaning the entire system within a certain time frame, such as, every 3, 4, or 5 years. A combination of mapping, color-coding, videotape, and documentation of complaints will be utilized to prioritize needs for preventative maintenance and future upgrades.
3. As with cleaning schedule, an inspection schedule should also be developed to insure that all parts of the system are inspected within an appropriate time frame.

B. Preparing to Respond

1. Designate one or more crews to pro-actively provide (1) routine inspections in accordance with established inspection schedule and (2) provide jetting, rodding and repairs, also in accordance with established schedule. Make sure that these crews have proper equipment and training with regard to their specific tasks.

C. Reducing Exposures

1. Twice each year, the Public Information Officer will include in the Town newsletter information on the availability of sewer backup insurance for homeowners. In addition, this information will be posted on the Town web site and updated as needed.

2. The Town will also make available to citizens the *Preventing Sewage Backups* brochure. This will be available as a handout as well as be included in the Town's welcome package for new citizens.

E. Containment

A. Receiving the Call

1. During normal working hours, all calls are to be routed to the Administrative Office of the Public Works Department. Gather all available facts/determine the following: Location, name of caller, phone number, time, date, nature of problem, what has been done so far, what people or property are at risk, etc. Show sympathy but remain calm and professional.
2. If the event occurs during normal working hours, the Water and Sewer Supervisor is to be notified so he can immediately respond to the location. After hours, the emergency duty person is to be contacted to respond to the scene. The duty person will assess the scene and then contact the appropriate on-call team for further assistance, if necessary. On normal work days, the Administrative Services office is also to be notified of the event. Otherwise, contact that office upon the start of the next regularly scheduled work day.

B. Field Response

1. All actions by the response team must be documented, showing the date, time and specific action taken during the initial response and subsequent follow-up visits. The team leader is responsible for completing the department's investigation report.
2. The initial response will vary greatly depending on the equipment available and the facts of the situation. Meet the caller/user and tell them what you will be inspecting (always be calm and professional). Prior to entering the property, the caller must sign the **Permission to Enter and Non-Waiver Defenses Agreement (SB-1)**. One copy is for the caller and the other is to be returned to the Administrative Services Department. Show respect for the home and sympathy for the people. Inspect the back-up area and take steps to protect people and property that may be at immediate risk.
3. Take all necessary steps as required to determine the cause of the problem. Take photos or video to document the actual situation – nature, extent, location and possible source/cause of the back-up; again, the exact steps will vary for each situation. Check the flow in manholes above and below the back-up location and document

findings. Televis the main lines to find the problem. Record on videotape and report.

4. If the source of the problem is in the customer's lateral line, clearly explain what they need to do to repair the problem. Confirm to the users that **THEY** need to arrange for clean up and clearing of lateral lines out to the street or to the main as determined.
5. If it is determined that the sewer main is blocked, quickly arrange for the repair and/or correction of the problem. If possible, provide assistance and advice to the user with regard to clearing the lateral lines. **DO NOT ACCEPT RESPONSIBILITY FOR THE BACK-UP OR PROPERTY DAMAGE.** Explain that the Town's insurance provider will make final determination regarding responsibility for cost of repairs/clean-up.
6. If the main sewer line is blocked, the Town will provide basic cleanup services to the affected areas. The users are to be given the Sewer Backup Information Form (SB-2) that indicates the provision of these services does not in any way mean that the Town assumes responsibility for the event. The user must sign and return one copy of the letter that is then returned to the Administrative Services office. A copy of the sewer back-up information handout is also to be provided.
7. If during normal working hours, the supervisor or lead worker then contacts the Administrative Services Office which then makes arrangements for the cleaning services. If during other hours, the supervisor or lead worker directly contacts the cleaning services and notifies the Administrative Services office of the event on the morning of the next regular work day.
8. Inform users that no matter how diligent the Town is, a risk of back-ups always exists.
9. Record pertinent information on the work order. Submit a copy to the Public Works Administration Office as well as the Administrative Services Office. Also forward any other documents to the Administrative Services Office that relate to the resolution of the insurance claim against the Town. Complete the Investigation Report (SB-3) as well as the Overflow Report (SB-4).
10. In the event that the affected user wishes to file a claim against the Town, they are to be directed to the Administrative Services Office. That office will handle the claim and coordinate the submission of documents to the insurance provider.

8.2 RODDING MACHINE STANDARD OPERATING PROCEDURE

A. Purpose

The intent of operating this equipment is to remove deposits and organic materials that can interrupt flow and result in sanitary sewer overflows (SSOs). The intent of cleaning should be to restore up to 95% of the cross section of the pipe during cleaning operations. This requires special tools and techniques as well as accurate recording and reporting to help determine whether a given pipe needs further cleaning, repair, or replacement because of structural problems. This field document describes the protocols of operation that will best ensure this result. The SOP assumes that the operator is experienced with this equipment beyond novice level or that an experienced operator is present to oversee the work. For specific detailed information about the specific machine, refer to the manufacturer's operation and maintenance manuals.

This document relates standards of operation under normal or anticipated conditions as used by DPW personnel under DPW policy and/or past practice. Documentation of these practices in no way limits equipment operation to these practices alone. This document is intended only as a guideline in equipment operation; during emergencies or other abnormal circumstances, some flexibility in using the equipment may be required.

Any questions, comments, additions, corrections, or changes to this SOP should be addressed to the appropriate field supervisor or their designee.

B. Policy

In its policy of maintaining the sanitary sewer system and eliminating sanitary sewer spills in the town of Vienna, Virginia, the Department of Public Works (DPW) utilizes different types of equipment and processes. Among these is mechanical cleaning using a truck mounted sewer rodding machine (rodder) in preventive and predictive pipe cleaning operations. The following Standard Operating Procedures (SOPs) are designed to create a standard use guide of field operations that will help avoid injury and damage to equipment or property; achieve efficient and effective line cleaning, and provide continuity in equipment use between operators.

C. Procedures

1. Personal Safety Equipment

All operators working in the field with this equipment must be protected from any hazards of operation that may be encountered. Operators and other personnel shall wear clothing appropriate to the weather conditions, as may be needed during operation, and observe DPW policy regarding steel-toed shoes; traffic safety vests; hard hats; gloves; and respiratory, hearing, and/or eye protection.

2. Hazard Identification

Any operator who sees, suspects, or knows of a potential safety hazard, including any equipment component, tool, set-up condition, traffic condition, etc., must immediately bring it to the attention of their supervisor, responsible party of the work crew, and/or other crew members. Any additional action(s) should be taken with this information in mind if corrective, anticipatory, or preventive measures are needed. If the hazard cannot be resolved with such action(s), the operator shall notify the supervisor prior to proceeding.

3. Training

Each operator of line-cleaning and flushing equipment shall be fully trained in machine operation and field use, and be thoroughly familiar with its operating techniques, including mechanical systems, safe set-up and control functions, tool selection, and driving the vehicle. No operator may ever attempt to enter a manhole when the machine is operating or without following DPW policy concerning proper confined space entry.

If any inexperienced personnel are in the field with this equipment at any time, an experienced operator must be present; each operator must complete suitable field training and demonstrate competency to the Superintendent or designee before operating equipment without an experienced operator present. Operational training shall include mechanical system awareness, detection of anomalies in operation and machine performance, field operation instruction, and debris disposal.

Cross-training of operators on varied maintenance equipment used by DPW will be provided as needed.

Each operator of this equipment shall read the manufacturer's operation and maintenance manuals and any other current reference materials used by DPW about the machine.

4. Operation Parameters

An operator may never, under any circumstances, operate equipment while under the influence of drugs or alcohol as defined by Town policy. Operators shall follow all applicable DPW and Federal Department of Transportation codes pertaining to Commercial Driver's License and other requirements.

Operators shall be classified employees and have the following minimum qualifications:

Experienced operators must:

- Be fully trained and familiar with all systems and tools necessary for specific conditions;
- Be able to set up and operate the machine under various field conditions; and

- Demonstrate proper operational technique to the satisfaction of DPW.

Inexperienced operators may operate the equipment only under immediate supervision of an experienced operator.

In addition to the above, the operator shall:

- Demonstrate the ability to read, comprehend, and interpret operation manuals, safety codes, and other information pertinent to correct and safe operation of the rodding machine;
- Possess knowledge of emergency procedures for equipment shut-down and how to summon assistance if needed;
- Demonstrate to DPW the ability to operate the specific type of equipment or provide other satisfactory evidence of qualifications and experience to do so;
- Be familiar with all relevant safety standards or safety codes, applicable government regulations, and DPW policies as they apply to the equipment, procedure, circumstance, and safety;
- Recognize and be responsible for all maintenance requirements of the rodding machine operated by the operator or by any trainee(s) under the operator's supervision;
- Be thoroughly familiar with the rodding machines control functions and tool applications; and
- Have read, fully understood, and signed off on these operation procedures, and have worked with a competent operator prior to sole operation of this equipment.

5. Operator Mechanical Familiarity:

Operators shall be familiar with the mechanical systems and maintenance, including;

Chassis:

- Location of engine fluid/s reservoirs and how to read them properly
- Location of fuel fill and fuel type
- Location of PTO engagement and chassis engine throttle and operation of same
- Tire condition and inflation pressures

Hydraulic System:

- Location of hydraulic reservoir for fluid check and system filter under operators station

- Location of rotary union and checking for excessive leaks indicating ring wear
- Hydraulic oil pressure gauge and pressure control valve and setting operating pressure

Electrical System:

- Location of all electric components and switches for operation and lighting
- Location of electrical system fuse block of Rodding machine and chassis

Communications:

- Hand held radios – understanding frequency use and settings

Rod Drive Head and Rod Storage Reel:

- Location of all bearings on the carriage, drive head, and frame for greasing
- Assess condition of drive chain and feed dogs
- Condition of the rod guide tube and wear
- Proper chain adjustment and counter operation (drive head mounted)

Basic Controls:

- Location and operation of rod lateral movement (in/out of the machine) control
- Location and operation of reel spin direction control and reel rotation speed control
- Location and reading of hydraulic pressure control valve and gauge to set pressure
- Location and setting of automatic system hydraulic pressure and automation controls
- Location, reading, and operation of footage meter/s
- Location and use of throttle and emergency shut-down procedures

Reference the original equipment manufacturer (OEM) operation and maintenance manual for suggested maintenance intervals and component information.

6. Machine Pre-Inspection and Maintenance:

Periodic equipment inventory inspections shall be conducted by the assigned operator. The inventory shall ensure the proper minimum mechanical tools, operational tools, and safety items for this equipment are on board and in proper operational condition.

Prior to machine use, a pre inspection of the machine chassis shall be made to insure proper mechanical operation. Regular checks of the following items as required by the chassis manufacturer, OEM, and/or DPW policy, per the Daily Equipment Check List (see Appendix I) should be made on a daily/weekly basis, which include;

- Check chassis engine fluid levels (oil, transmission, coolant, etc.)
- Check belts, hoses, and other typical wear items as required by the inspection form
- Check lights, signals, tail/brake lights, emergency beacons/flashers, and windshield wipers.
- Check tire inflation and lugs
- All gauges and controls should operate freely and in the designed intention prior to full operation
- Rod checked and replaced as needed

Routine maintenance shall be conducted at regular intervals for oil changes and other chassis maintenance by the Vehicle Maintenance Division on a scheduled basis. Routine greasing of bearings and other mechanical procedures of the rodding machine, as defined by the OEM's operation and maintenance manual, and good mechanical practice, shall be done by the operator. Regular cleaning of the rodding machine exterior and interior of the machine itself should be done on a routine basis when possible.

7. Machine Transport Prep:

The following steps should be observed when preparing to transport the rodding machine for field work;

- a. Fill out the daily Town of Vienna Vehicle Defect Card prior to using the machine.
- b. Check for proper tools necessary for planned rodding machine operations, ie, squarebars, augers, combination and proofing tools. Examine tools and replace/repair as needed, ensure tools and operation hardware are supplied by, or approved by the manufacturer.

- c. Place all required field equipment into vehicle which may include, but not be limited to;
- Traffic safety equipment, including cones, flags, signs, etc
 - Field tools, shovels, picks, etc
 - Personal safety equipment (hard hats, vests, etc.)
 - Manhole lid hooks, sledge hammer, or other access tools necessary
 - Debris removal tools, ie; catchers, shovels, etc., container for debris
 - Portable radios, maps, data collection forms or instruments
 - Any other required equipment as needed
- d. Once equipment is loaded, secure all tool boxes and cowling doors on the rodding machine for transit to the job site.

8. Machine Transport:

Travel to the site should be routed with flow direction in mind, to arrive with the rear of the truck pointing in the direction of rod travel whenever possible at the operators discretion. Observe proper driving procedures for vehicles of this class, which include;

- Adjust all mirrors as needed for the driver prior to putting truck in gear
- Driver and passenger/s buckle seat belts
- Avoid sudden starts and stops
- Do not exceed the posted speed limit
- Slow down whenever traveling over unimproved or flawed roads, railroad crossings, or other hazards
- Set up for any turns by being in the proper lane at least 100 yards before the turn
- Always use directional signals
- When turning avoid sharp turns at high rates of speed
- Do not back up in traffic without a backing assistant to clear the path

9. Street Set Up:

When setting up on the street, make every attempt to keep one open lane for traffic, if possible, on the side of the truck opposite the operation controls.

Once pulled up to the manhole, the following procedures should be observed prior to operation;

- Determine if flagger/s are needed by the traffic volume, if police are needed, contact supervisor
- Turn on amber emergency beacon lighting and directional arrow board dictating traffic flow
- Placement of road cones around the vehicle – *Fig 1*
- Cone off or otherwise designate a work area that includes the immediate manhole
- When operator/s go to the far manhole for tool changes, set out cones around the work area

Operators should be trained and familiar with work zone safety guidelines and follow DPW policy relating to proper signage, cone placement, and flagging as needed.

Figure 1



10. Machine Set Up:

When maneuvering the machine for operation, the back of the machine should point in the direction the tool will be used to rod whenever possible. This insures a straight down and in path for the rod and rod guide hose and reduces bends which can damage rods while rotating.

- a. Remove the guide hose from the machine and lay it out along the road, directly in back of the machine, using care not to let the hose force operators into the flow of traffic - *Fig 2*.

- b. If the guide hose is stiff and unable to bend easily, it should be treated with light oil prior to use. Use of automatic transmission fluid, Marvel Mystery Oil, or other long term penetrating lubricant should be used weekly in the hose flex-metallic liner to help free rusted joints and allow the hose to be limber for set up – *Fig 3*.

Figure 2



Figure 3



- c. Select the tool to go up the pipe to the next manhole. This should be an auger one size smaller than the pipe diameter – *Fig 4*, or a small probing tool can be used if the auger cannot move up the pipe. If relieving a stoppage, a squarebar corkscrew should be used at one to two sizes down from the pipe diameter – *Fig 5*.

Figure 4



Figure 5



- d. Using a turning handle to secure the rod coupling center hole pin, attach the tool to the rod coupling and tighten the nut securely with an assembly wrench – *Fig 6*.
- e. Check for proper pressure setting of the machine on the control panel – *Fig 7*. As a guideline, forward pressure should not exceed 300psi to 350psi.

Figure 6



Figure 7



- f. Retract the rod into the machine, leaving only the adaptor rod from the tool showing and set up the guide hose in the pipe, ensuring the end is in the invert and the brace is positioned so it prevents the end of the hose from exiting the invert entrance.
- g. Once the guide hose is placed into the line, use the brace to secure it in. This brace should always be used with the rod guide hose to prevent it from moving out of the invert, unless special circumstances prohibits its use – *Fig 8*.
- h. Once set up, pull the vehicle forward carefully to pull any slack or bend out of the guide hose for a smooth, low angled entry of the rod into the pipe. Once completed, secure the rope for the lower manhole brace and chock the tires on the vehicle – *Fig 9*.

Figure 8



Figure 9



- i. Zero out all footage meters to ensure tool location in the pipe, should it be necessary.

11. General Machine Operation:

Operation of the rodding machine depends on the pipe condition and what needs to be cleaned, or the “mission” of the operation. There are five standard missions in rodding, these are; root removal, grease removal, blockage removal, routine preventive maintenance, and secondary are specialized use, such as line stringing for bucketing work or camera operation.

Operation techniques for these primary operations vary a little, however, there are some common circumstances to avoid with any use of the machine, these are;

- Do not rotate the rod without moving it slowly in or out of the machine to avoid heat build up
- Do not use excessive pressure to push rods through obstacles
- Start with a tool one pipe size smaller, if it does not operate effectively, downsize it
- Do not stress rod by excessive rotation when the tool is not turning
- Do not stress rod by pushing into materials, use technique and withdraw and re-engage repeatedly
- Perform tool changes at the far manhole during operations, perform heavy cutting while pulling back

The use of a debris trap in the downstream invert should always be made to capture materials cut loose during operation. This can be done using the expanded metal type traps, or commercial scoops which may be on the machine – *Figs 10 and 11*.

Figure 10



Figure 11



12. Machine Operation - Removing Materials:

The overall goal of rodding a pipe is to ensure a minimum of 95% of the original design capacity of the pipe is restored. To effectively perform this task, use of a pipe size 'proofing' tool is necessary on at least one pass of the pipe, preferably the final pass, depending on the nature of the material. The following techniques should be observed when performing this work.

- a. In known root intrusion pipes, an auger, 1 size smaller than the pipe diameter should be used to pilot a working hole through the pipe to the far manhole, which is gaffed up at the far manhole to make the tool change – *Fig 12*.
- b. A combination pull back tool (root saw with finishing blade cutter (*Fig 13*)) should be installed and used to make the return pass cut. All heavy cutting should be done on the pull back pass.

Figure 12



Figure 13



- c. In known heavy grease lines, a small auger should be used to pilot a working hole through the pipe to the far manhole, where the next size auger can be installed, or, a three blade cutter installed to remove grease on the reverse pass in increasing sizes until done.
- d. When performing the tool change and other work at the far manhole, the machine operator shall pay close attention to radio calls and/or hand signals from the far manhole personnel.
- e. Radio calls or hand signals should be confirmed by the recipient to avoid confusion and ensure the proper response with the machine is made, with the exception of the "stop" command, which would be executed immediately. In deep manholes the crew member at the far manhole may need help in pulling the rod and tool out for the tool change.
- f. Once stopped, put controls into neutral and shut down machine, standing by to re-start the machine once the far manhole personnel have completed their task.
- g. Personnel at the far manhole should shake the tool prior to removing it from the manhole invert to ensure no excess torque is on the rod. Avoid holding the tool by the cutting blade in the event of unexpected tool movement.

- h. Once tool change is complete, the machine operator shall be signaled by the personnel at the far manhole to pull the rod slowly back. Once the tool has cleared the invert opening, personnel at the far manhole shall signal rotation and the reverse pass cutting operation shall begin.
- i. As the tool is withdrawn back through the pipe, use the recommended speed and technique for the specific tool.
- j. Use caution not to over torque or stress the rod by pushing/pulling into materials.
- k. When working in hardened grease, remove it using the debris trap/scoop or chop up any large pieces of grease dislodged during cleaning so they do not cause problems downstream. Large roots should be removed and properly stowed on the truck and disposed of back at the Yard.

Attention to torque and pressures cannot be overstated. Keep operation pressures at or below 300psi to 350 psi, using technique of operation to remove materials. Do not force the tool into material, or allow the tool to become lodged and keep constant pressure on it allowing torque to build. This will stress the rod and lead to damage either during operation, or shortly thereafter.

13. Machine Break Down:

Once the rodding operation is completed in that section of pipe, or for the day, the following steps should be taken to move to the next location or back to the shop;

1. Once the cleaning tool has reached the rodding machine manhole, remove the guide hose from the manhole, using caution the hose does not force the handlers into the path of traffic, and lay it out on the street.
2. Move the rod out of the guide hose for tool removal or replacement with the auger for the next run. If using the machine in another section, replace the tool with the proper auger and wrap it around the machine to the next manhole. Avoid hard bends which can kink the rod.
3. If stowing for the day, remove the tool and install a pilot bullet tool hand tight on the end of the rod. Withdraw the rod fully into the machine leaving the pilot bullet tool at the very end of the machine ready to rethread the guide hose. Do not leave rod in the guide hose overnight as sewer acids in the hose can affect the rod and a coil set bend in the guide hose can develop.
4. Wrap the guide hose around the machine and stow it securely. If the guide hose is stiff and difficult to maneuver and bend, lubricate with oil once back at the shop.

5. Clean up around both manholes, cleaning up any materials which have come out of the pipe, or sweeping them down into the manhole if they are not to be hauled away. Clean around the rim of each manhole so the covers fit properly. Align the cover with road striping if present to ensure the cover rests properly in the frame and the stripes line up.

14. Job Site Break Down:

Use the following protocol in retiring from the job site for traffic control;

- Move the road cones from the immediate work area working backwards towards truck
 - Remove chocks from vehicle and stow
 - Move the vehicle to the curb or safe parking area if traffic is moderate or high
 - Once all equipment is **accounted for** and stowed, shut down amber lights and arrow board/s
 - Fill out all report paper work before moving to the next call or returning to the Yard
1. Record all information and events on the job as soon as the jobsite is closed out, before moving to the next call.
 2. Once the vehicle is parked at the yard, any tools or equipment needing repair should be reported to the supervisor. **Tools removed/borrowed from other vehicles should be returned to those vehicles.**
 3. Secure all tools into locking tool boxes, lock boxes and chassis doors.
 4. Removal of any debris retrieved from manholes during the days operations and disposal
 5. Fill out all daily log reports or information which were not done on-site, as needed or required.

15. **Special Circumstances:**

Upon occasion, special circumstances as described here may require special use of the machine. The following sections are guidelines on the more common circumstances encountered, which are used in emergency stoppage removal and retrieving broken rod.

Lined pipe, or pipe that appears lined, should be referred to the supervisor for further investigation possible lining. Flushing equipment should be used in lined pipes.

a. Retrieving Broken Rod:

1. If rod breaks, note the footage on the machine counter. Retract the rod to the machine, determine the footage of where the tool is likely located in the pipe, and remove the guide hose from the manhole.
2. The tool and/or broken rod can be retrieved using a pick up tool, or if none available, a small square bar corkscrew at the discretion of the operator.
3. Pushing the tool up the line, proceed until resistance is felt on the tool as it engages the broken rod or tool in the pipe, or travel about 6 feet or so past where you believe the broken rod end is in the pipe.
4. Slowly rotate the tool and draw the rod back, watching the hydraulic pressure gauge to determine when the tool has snared the string of rod in the pipe (a spike in hydraulic pressure will show on this gauge if the gauge is working properly). Withdraw the rod slowly to keep positive connection to the rod until it reaches the operating manhole.
5. Repeat this process as necessary in increments to snare the rod string, starting at 6 foot past, go to 8 foot, then 10 foot, etc.

b. Emergency Stoppage Removal:

When responding to stoppage calls, observe the following protocols;

- a) Whether during working or off-hours, handle all emergency calls quickly and efficiently. Response time goals are 30 minutes for initial response during working hours and one hour after hours.
- b) When responding, avoid parking on private drives and use caution when on lawns or easements; use care to avoid unnecessary damage to grounds, shrubbery, landscaping, or property items in the off-road right-of-way.
- c) On arrival, check the upstream and downstream manhole/sewer main to determine whether the problem is in the DPW main or the customer service connection. If the sewer main appears clear, inform property owner the system is clear.
- d) If the stoppage is on the customer side, tell the customer to call a licensed plumber or contractor to take care of the problem. Do not, under any circumstances, recommend a specific plumber or other tradesman. DPW does not provide repair or cleaning services to private sewer lines or connections unless it is approved by the responding supervisor.
- e) If the stoppage is determined to be in the Town sewer main, follow these protocols:

1. Under typical spill response conditions, one unit will be dispatched to the scene with a field supervisor.
2. Until the supervisor arrives, the senior operator has “incident command.” The incident commander determines how the spill will be managed.
3. When possible, make stoppage relief from the dry, downstream manhole. Do not try to relieve the stoppage from surcharged manholes unless all other options have been exhausted. Attempting stoppage relief from flooded manholes can be dangerous.
4. Install a trap so stoppage cause can be identified if possible. Use a squarebar corkscrew a size or two smaller than the pipe diameter to relieve the blockage.
5. Once the stoppage starts to relieve, raise the rod guide hose slightly and out of the flow to prevent materials from hanging up on its edges.
6. If flow is back to normal close up the job. Determination if further cleaning is necessary is the discretion of the supervisor.
7. Within 24 hours of the event, the pipe is to be CCTV inspected. If CCTV unavailable, a cleaning protocol of two sections upstream and two sections downstream will be followed to ensure the pipe is clean of material.
8. To remove materials from the overflow, wash down the spill manhole and the two manholes upstream.
9. After a spill, at the discretion of the supervisor, check manholes beyond the first two manholes upstream and/or in connecting lines. This can be done during the event or the next working day to ensure that no solids that can cause odors remain in the manholes.
10. If customers or affected property owners ask questions, refer them to the immediate supervisor for further information on claim forms or other matters. Do not, under any circumstance, commit to any corrective action(s) with property owners.
11. Do not, under any circumstance, enter any private structure unless a formal written permission form has been filled out and at the direction of, or in company with, the supervisor.
12. On completion of the work, the responding supervisor will fill out the event paperwork to document the activity, cause, and specifics of the response. Supervisor will contact Department of Environmental Quality (DEQ) within 24 hours of the event and complete the required State paperwork for the event.
13. In all sewer spills (from the Town system), the Director of Public works and Information Officer of the Town must be notified by the supervisor.

16. Field Safety:

For more detailed safety information, refer to the manufacturer operation manual. The following are guidelines that should be followed on each job;

1. Always be aware of traffic and safety concerns. When setting up on the street, always follow DPW practice in traffic cone and sign deployment.
2. Always wear DPW approved clothing that are appropriate for weather conditions, foul weather gear, footwear, reflective safety vests, gloves, and personal protection equipment (hard hats, eye protection/hearing protection) per DPW policy when operating.
3. When traveling, be sure all doors, tool boxes, and equipment are secured and not able to leave the vehicle when turned or bounce out on rough road.
4. Be sure all emergency and vehicle lights are functional.
5. Inspect the sewer rod regularly for wear and either reverse the reel or change regularly. Avoid using forward rod pressures which exceed 300 to 350 psi.
6. Avoid using the rodding machine without the proper guide hose and brace assembly to avoid rod damage and potential injury.
7. Under no circumstances should anyone be in the manhole when the rodding machine is in operation.
8. Avoid rod damage by moving the rod in/out of the machine while rotating, rotating rods in one place can heat them and cause them to break.
9. Never leave the machine unattended during operation. An operator should be at the control panel in the event immediate action is necessary.
10. Use the proper tool for the job. Understand how each tool works (refer to the Operators Guide Manual) and when it should be used.
11. Maintain the machine and accessories regularly.

a. Maintenance:

Periodic maintenance of the machine shall be made on regular intervals. Consult the manufacturers' maintenance manual for approximate intervals for;

1. Grease all fittings, which include, bearings on either side of the rod storage reel, each end of the unitary frame, and all fittings on the rod drive mechanism.
2. Continuous drive rollers should be examined for wear and that sprockets are not bottoming out indicating there is no more adjustment remaining.
3. Oil all counter and controls assemblies, which include; footage counter rollers and components, control valve stems, and control levers.
4. Check all operation gauges, controls, and linkages at the control panel. Remove rust on control arms and other areas frequently with light steel wool or emery cloth and apply engine oil lightly on exposed metal areas to reduce rust build up.
5. Inspect glycerin filled gauges for cracks, leaks, or hazing. Replace if any noted.
6. Check condition of hydraulic system hoses, especially those exposed to weather at the rear of the machine at the rotary union. Hose should be relatively smooth without major cuts in the surface of the hose.
7. Changing of the hydraulic filter (located under operators station, under the hydraulic oil reservoir) approximately every 300 hours or as required by sound maintenance practice.
8. Once a week, or as needed, oil the rod guide hose to keep it limber and easy to use.

8.3 FLUSHING & VACUUMING STANDARD OPERATING PROCEDURE

A. Purpose

The intent of operating this equipment is to remove deposits and organic materials that can interrupt flow and result in sanitary sewer overflows (SSOs). The intent of cleaning should be to restore up to 95% of the cross section of the pipe during cleaning operations. This requires special tools and techniques as well as accurate recording and reporting to help determine whether a given pipe needs further cleaning, repair, or replacement because of structural problems. This field document describes the protocols of operation that will best ensure this result. The SOP assumes that the operator is experienced with this equipment beyond novice level or that an experienced operator is present to oversee the work. For specific detailed information about the specific machine, refer to the manufacturer's operation and maintenance manuals.

This document relates standards of operation under normal or anticipated conditions as used by DPW personnel under DPW policy and/or past practice. Documentation of these practices in no way limits equipment operation to these practices alone. This document is intended only as a guideline in equipment operation; during emergencies or other abnormal circumstances, some flexibility in using the equipment may be required.

Any questions, comments, additions, corrections, or changes to this SOP should be addressed to the appropriate field supervisor or their designee.

B. Policy

In its policy of maintaining the sanitary sewer system and eliminating sanitary sewer spills in the Town of Vienna, Virginia, the Department of Public Works (DPW) utilizes different types of equipment and processes. Among these are hydraulic cleaning using a truck mounted sewer flushing/vacuum machine (Jet-Vac) in preventive and predictive pipe cleaning operations. The following Standard Operating Procedures (SOPs) are designed to create a standard use guide of field operations that will help avoid injury and damage to equipment or property; achieve efficient and effective line cleaning, and provide continuity in equipment use between operators.

C. Procedures

1. Personal Safety Equipment

All operators working in the field with this equipment must be protected from any hazards of operation that may be encountered. Operators and other personnel shall wear clothing appropriate to the weather conditions, as may be needed

during operation, and observe DPW policy regarding steel-toed shoes; traffic safety vests; hard hats; gloves; and respiratory, hearing, and/or eye protection.

2. Hazard Identification

Any operator who sees, suspects, or knows of a potential safety hazard, including any equipment component, tool, set-up condition, traffic condition, etc., must immediately bring it to the attention of their supervisor, responsible party of the work crew, and/or other crew members. Any additional action(s) should be taken with this information in mind if corrective, anticipatory, or preventive measures are needed. If the hazard cannot be resolved with such action(s), the operator shall notify the supervisor prior to proceeding.

3. Training

Each operator of line-cleaning and flushing equipment shall be fully trained in machine operation and field use, and be thoroughly familiar with its operating techniques, including mechanical systems, safe set-up and control functions, tool selection, and driving the vehicle. No operator may ever attempt to enter a manhole when the machine is operating or without following DPW policy concerning proper confined space entry.

If any inexperienced personnel are in the field with this equipment at any time, an experienced operator must be present; each operator must complete suitable field training and demonstrate competency before operating equipment without an experienced operator present. Operational training shall include mechanical system awareness, detection of anomalies in operation and machine performance, field operation instruction, and debris disposal.

Cross-training of operators on various maintenance equipment will be provided as needed.

Each operator of this equipment shall read the manufacturer's operation and maintenance manuals and any other current reference materials used by DPW about the machine.

4. Operation Parameters

An operator may never, under any circumstances, operate equipment while under the influence of drugs or alcohol as defined by Town policy. Operators shall follow all applicable DPW and Federal Department of Transportation codes pertaining to Commercial Drivers License and other requirements.

Operators shall be classified employees and have the following minimum qualifications:

Experienced operators must:

- Be fully trained and familiar with all systems and tools necessary for specific conditions;

- Be able to set up and operate the machine under various field conditions; and
- Demonstrate proper operational technique to the satisfaction of DPW.

Inexperienced operators may operate the equipment only under immediate supervision of an experienced operator.

In **addition** to the above, the operator shall:

- Demonstrate the ability to read, comprehend, and interpret operation manuals, safety codes, and other information pertinent to correct and safe operation of the flushing and vacuum machine;
- Possess knowledge of emergency procedures for equipment shut-down and how to summon assistance if needed;
- Demonstrate to DPW the ability to operate the specific type of equipment or provide other satisfactory evidence of qualifications and experience to do so;
- Be familiar with all relevant safety standards or safety codes, applicable government regulations, and DPW policies as they apply to the equipment, procedure, circumstance, and safety;
- Recognize and be responsible for all maintenance requirements of the flushing/vacuum machine operated by the operator or by any trainee(s) under the operator's supervision;
- Be thoroughly familiar with the flushing and vacuum control functions and tool applications; and
- Have read, fully understood, and signed off on these operation procedures, and have worked with a competent operator prior to sole operation of this equipment.

5. Operator Mechanical Familiarity

Operators shall be familiar with the equipment's mechanical systems and maintenance, including:

Chassis:

- Location of fluid reservoirs and how to check levels;
- All vehicle directional indicators, brake lights, and night running lights;
- All emergency lighting, including beacons, traffic control arrows, and night operation lighting;
- Air brake system and appropriate CDL-required checks; and
- Tire condition and inflation pressures.

Hydraulic System:

- Location of hydraulic reservoirs for fluid checks; and
- Hydraulic oil pressure gauge and reading.

Hose Reel:

- Location of bearings for greasing, including reel and articulation bearing;
- Location and inspection of reel articulating and foot jack system;
- Location and familiarity of hose reel grease points; and
- Condition of sewer cleaning hose.

Electrical System:

- Location of all electric components and switches for operation and lighting; and
- Location of electrical system fuse block for the machine components.

Basic Controls:

- Location and operation of power take off from chassis and emergency shut-downs;
- Operation of debris body for dumping and decanting water, and travel after use;
- Location and operation of water control valves for sewer hose use;
- Location and operation of hose reel direction and speed control valve;
- Location and reading of hydraulic and water pressure gauges;
- Location and operation of footage meter;
- Location and operation of vacuum boom controls on boom tower and on both reel and pendant; and
- Location of debris tank fill level indicator.

Refer to the original chassis and the equipment manufacturers' operation and maintenance manuals for suggested maintenance intervals on these systems.

6. Machine Pre-Inspection and Maintenance

Operators, as assigned, shall periodically inspect the equipment inventory. The inventory shall ensure that the proper minimum of mechanical tools, operational tools and nozzles, and safety items are on board and in proper operational condition.

Regular checks of the following items as required by the chassis and equipment manufacturer maintenance guidelines, DPW policy, and/or the Town of Vienna Vehicle Defect Card should be made, including:

- Check engine fluid levels (oil, transmission, coolant, etc.) in chassis;
- Check water system strainers (fill and pump) and flushing of water pump;
- Check belts, hoses, and other typical wear items as noted on the form;
- Check lights, signals, tail and brake lights, and emergency beacons and flashers;
- Check tire inflation and lugs;
- Check air brakes and bleed tanks;
- Start and warm up engine before leaving the yard and note operation of chassis gauges; and
- Check debris tank lift at least weekly and ensure that tank and boom are returned to travel positions.
- Check vacuum system filtration after use to ensure that it is clean and well-maintained

Routine maintenance shall be conducted by Vehicle Maintenance Division at regular intervals for oil changes and other mechanical procedures, as defined by the manufacturers' operation and maintenance manuals and good mechanical practice.

7. Machine Start-up and Transport

Follow these steps when starting the machine or chassis and when traveling to field work:

- a) Fill out the Town of Vienna Defect Card before using the machine and return it to the supervisor at the end of the shift.
- b) Check for Vacuum tubes, manhole gaffing tools, scoops, etc. Examine nozzles periodically to ensure that orifices are not clogged by debris or worn, and repair or replace them as needed. Check tiger tail and replace it when wear is excessive and no longer protects the sewer hose.
- c) Ensure that all required field equipment is on the truck. This may include, but is not limited to:
 - Traffic safety equipment, including cones, etc.;
 - Field tools, shovels, picks, etc.;
 - Personal protection equipment (vests, gloves, etc.);
 - Manhole lid hooks, sledge hammer, and other necessary access tools;
 - Manhole tools, including debris removal tools, clam shovels, scoops, traps, etc.;
 - Cellular telephone (Town-issued), portable radio(s) as needed, maps, and data collection forms and instruments; and
 - Any other required equipment, as needed.
- d) Ensure that bungee cords used to lash tools to chassis are in good condition.
- e) Once equipment is loaded, secure all tool boxes on the truck for travel. When leaving the truck unattended, lock the tool boxes.
- f) Start chassis engine and wait for air system to charge. Be sure that oil and air pressures are up and that beacon lights are functioning before moving the vehicle.

8. Machine Transport

Observe proper driving procedures for vehicles of this class, which include:

- Adjust all mirrors as needed by the driver before putting truck in gear;
- Buckle seat belts (this applies to all passengers as well as the driver);
- Avoid sudden starts and stops;
- Do not exceed the posted speed limit;
- Slow down whenever traveling on unimproved or flawed roads, at railroad crossings, or near other hazards;
- Set up for any turns by being in the proper lane at least 100 yards before the turn;
- Use directional signals before changing direction;
- Avoid making sharp turns at high speed; and
- Do not back up without a backing assistant to clear the path.

9. Street Set-up

Whenever possible, determine the machine position on the street before arriving at the work site. This can be done from maps or experience, knowing the direction of flow, and always working from the downstream manhole whenever possible. Look for and take into consideration any traffic concerns or other hazards that may exist on or near the site. Once at the work site, observe the following procedures before operation:

- Turn on amber emergency beacon lighting and directional arrow board to dictate traffic flow;
- Place road cones around the vehicle and work area of the manhole being accessed; and
- When an operator goes to the far manhole, set out cones at that work area, as needed based on conditions.

10. Machine Set-up—Flushing System

Maneuvering the machine for operation may require reel articulation or maneuvering of the truck to reach the manhole or to center the hose in the manhole itself. Avoid blocking all road traffic; leave at least one lane for passing traffic. If only one lane is left open, it is recommended that traffic is routed to the driver's side of the vehicle whenever possible.

- a. Maneuver the reel to the proper location if necessary (or to vehicle as needed). Then set out road cones and engage the Power Take Off (PTO) for the water pump; see *Figures 1 and 2*.

Figure 1



Figure 2



- b. Remove the end of the hose from the hose reel, using care not to move out of the protected area of the machine and cones, and select the nozzle for the type of work being done.
- c. Install a tiger tail to protect the hose from being cut on the invert opening; see *Figure 3*.
- d. It is recommended to install a finned nozzle extension appropriate for the size nozzle being used to prevent the nozzle from turning up service connections or jumping out of the pipe in manholes that may be hidden - *Figure 4*.

Figure 3



Figure 4



- e. Lower the hose and tiger tail to the invert, lay them flat on the floor of the pipe, and engage the water pressure to about 500 pounds per square inch (psi) to move the nozzle into the pipe.

- f. Install a debris trap in the downstream invert to trap and quantify materials removed during cleaning; this can be either an expanded metal or commercial scoop type – *See Figures 5 and 6.*

Figure 5



Figure 6



- g. When the nozzle moves up the line, provide enough slack so that about half the tiger tail runs into the pipe and is secured by hose tension to the crown of the pipe. Tie off the tiger tail so it will not move up the pipe. Operation will begin from here unless the vacuum system is necessary.
- h. To avoid purged plumbing complaints (blown toilets), use caution in lines that have a low slope, are shallow, and/or have low flow in them, and use the appropriate nozzle and lower pressure to clean. When feasible, open the far manhole to introduce more air into the line to relieve the negative air pressure caused by nozzles that drain toilet traps.
- i. When cleaning lines, check the upstream manhole to confirm that the nozzle has reached the far manhole (especially when using the root cutter and proofing tool) and be sure that it has not pushed rocks or other objects into the structure.
- j. Record all cleaning results, such as the type of debris and other materials seen or removed, the amount removed from the line section (light, medium, heavy), and any other information about the job, including manhole inspections at each manhole access

11. Machine Set-up—Vacuum System

- a. In areas where it is difficult for personnel to stand or access, stand-off (remote) pendant control for the vacuum boom can be used. Determine whether the stand-off pendant control will be needed during operation; if so, ensure that the pendant is plugged in and operational. Otherwise, use the panel-mounted controls.
- b. Before using the vacuum boom, stand away from the vehicle and look for any overhead obstructions such as trees, building porticos, overhead pipes, or other assemblies, and- **Most Importantly**-Power and Telephone lines. –*see Figure 7*

- c. Determine the number and type of aluminum vacuum sections needed and assemble them either as they are placed into the manhole or on the ground before lifting them into the manhole- *See Figures 7 and 8*
- d. To prevent unintentional release, duct tape may be used on clamps going below ground. If the tube clamp fails, a length of rope that is at least 5/8" can be tied to the vacuum tube nozzle (crown) for retrieval- *See Figure 9*

Figure 7



Figure 8



Figure 9



- e. Attach the boom hose to the tubes once the right height has been reached.
- f. If the proper flushing nozzle has not been installed with the hose in the line, install it first, then lower the vacuum into the manhole for use during cleaning operations.
- g. The vacuum can be used as the flushing nozzle cleans, or, if the downstream manhole is blocked or has a debris catcher installed, it can be used periodically during cleaning operations.
- h. To trap and remove debris, set up a debris catcher (trap/scoop) in the downstream invert from the manhole being cleaned. Clean any line with significant debris with the vacuum system as needed.
- i. On any line that demonstrates a material load, trap the debris to determine the type and amount of material in the pipe and to facilitate removing it from the line.
- j. In pipes of 15" diameter or more, specialized traps may be needed to trap debris so it does not escape downstream. Periodic debris removal may be required during these operations.

12. Machine Operation

Operation of the flushing system depends on the pipe condition, materials being removed, location, and the need to remove debris. Although operation techniques vary for different cleaning situations (such as grease, sand, and other materials) under all circumstances, use the following techniques:

- Do not try to remove too much debris in one pass of the nozzle and bury the hose;
- When removing large amounts of debris, grit, dirt, rocks, etc, use short, repeated cleaning passes;
- Use a wire-braid-reinforced leader hose, especially when removing static debris;
- Protect the hose by using a tiger tail, stationary roller, or other device at remote manholes; and
- Be aware of and monitor the water level in the water storage tanks, and do not let the system run dry.

13. Water Fill-Up

Water fill-up is allowed from any designated fire hydrant in the Town of Vienna (red painted hydrants only). In low pressure areas either return to the yard for water or drive into higher pressure area.

Exercise care when operating hydrants by using the proper wrenches and the proper opening/closing techniques to avoid turbulence that discolors the water, avoid water hammer, and reduce the chance of a hydrant bursting underground. To remove rust particles from the water, bleed hydrants until the water runs clear.

- To turn hydrant water on/off, use only a hydrant wrench;
- Use appropriate fill hose for filling, and, after filling, for proper draining and stowing.
- Be sure that the condition of the fill hose is good and that it is not leaking.

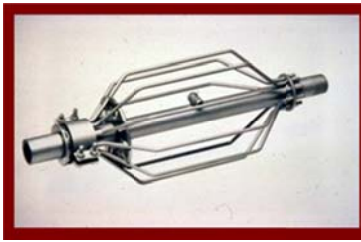
14. Cleaning Protocols

Finned Nozzle Extensions



Finned nozzle extensions come in a variety of sizes to accommodate various nozzle sizes and types, and are used as the main cleaning mounting for the nozzles, except for the Bulldog and heavy-debris nozzles. Finned nozzle extensions are used to reduce the wear on the proofing skids during repeated cleaning passes.

Proofing Skids



A proofing skid is used to prove that the pipe is clean in lines where it is suspected that material remains or that there are mechanical problems, such as protruding service connections or joint misalignments. This tool passes within an inch of the pipe walls and will usually signal any grease, roots, or other debris that can pose a risk of a Sanitary Sewer Overflow (SSO). This tool can be used on the first pass to see whether the pipe is clear, but if repeated cleaning passes are needed, then it should be changed out before being used again.

- k. Nozzle selection for a given pipe cleaning task is up to the operator, and is based on experience and/or known issues with the pipe. Select the nozzle with the best likelihood of cleaning the pipe and mount it on a skid to lift the nozzle in the pipe and avoid premature wear.
- l. Avoid use of rotating chain flails or root cutters in rocks, gravel, and clay pipe or Polyvinyl Chloride (PVC) pipe unless all other options have been exhausted.
 - When cleaning pipes 6", 8", 10", and 15" in diameter, trap the debris to determine the type and amount of material in the pipe and to be able to remove it from any line that demonstrates a material load.
 - In routine cleaning, a proofing tool can be used on the first pass up the line to see whether the line has any materials in it or on the last pass if there is a question of how well the pipe has been cleaned. If the tool makes it to the far

manhole and back without any sign of debris in the trap, the line can be considered clean. If the tool stops, write down the footage for referral for inspection by closed-circuit television (CCTV) and note the need for the inspection.

- Fill out job paperwork completely. Record any unusual materials or debris found on the forms in the space provided. Accurately record information as requested on the form(s), including manhole condition observations at both the upstream and operating manholes.

Grease Removal

Fats, oils, and grease (FOG) can be difficult to remove unless the proper nozzles, and other types of equipment, as well as appropriate techniques, are used.

1. To remove known grease masses, a crown nozzle, rotating nozzles, hydraulic root cutter, or chain flail nozzle can be used to reach the sides and crown of the pipe.
2. To better ensure that a blockage will not form during operations, clean the pipe from the downstream side of the grease mass (from the clean pipe area to the area with the heaviest grease deposits).
3. At the downstream manhole, use the debris trap to ensure that large chunks of grease do not pass downstream and that they are pulverized, removed by scoop, or vacuumed up so as to not cause a line stoppage downstream.

Sand and Debris Removal

To move heavy debris from sanitary lines, use an invert debris-cleaning nozzle (sand nozzle).

1. To protect the hose from flying rocks and other sharp debris typically found in static deposits, use a wire-braid-reinforced leader hose.
2. If the vacuum is not being used as the nozzle moves debris toward the trap, use a sand trap or other debris-catching device. Keep the trap in the downstream manhole so that debris can be removed with the clam shovel, trap/scoop, or vacuum.
3. In significant sand/debris deposits, move the nozzle slowly up the pipe about 30 feet, then pull back and gauge the debris. If a large deposit forms in the manhole, repeat until the debris lessens by at least half, then proceed another 10 to 30 feet. Repeat this step cleaning to remove the debris from the pipe. This step-cleaning process can be expanded by increments of 20 to 50 feet or more, depending on how much material is in the pipe.

4. When cleaning static deposits, avoid trying to clean too many feet of pipe in one pass because the hose can be easily buried and become stuck in the pipe.
5. When using the vacuum, maintain an eye on the level indicator and stop vacuum operation when the indicator reads close to full. Water can then be decanted from the debris tank to reduce volume and allow more debris to be captured and stored.
6. When raising the debris body to decant water in the field, be aware of and look for any overhead obstructions or hazards.

15. Machine Breakdown

Once cleaning operations are completed in a section of pipe or for the day, take the following steps in closing down the site:

1. Bring the sewer nozzle up to the hose reel and secure it with cord to prevent the hose or nozzle from bouncing off the reel.
2. If the vacuum was in use, adjust the boom so that the vacuum tube(s) can be retrieved from the manhole or lifted out. Before moving the boom, look for any overhead obstructions that may exist and any new obstructions that may have appeared since starting work.
3. Detach the vacuum tube(s) as needed, using care to not move outside the coned-off work area.
4. Move the boom to the travel position and secure the flexible end of the vacuum hose.

16. Job Site Breakdown

Use the following protocol in retiring from the job site for traffic control:

1. Move the road cones away from the immediate work area, working backwards from the truck;
2. If traffic is moderate or high, move the vehicle to the curb or safe parking area.
3. Once all equipment has been **accounted for** and stowed, shut down amber lights and arrow board(s).
4. Before performing the next job, fill out all report paperwork.
5. If done for the day, dump the debris tank at the assigned DPW decanting/dumping station before returning to the yard. For safe transport, decant the debris tank water as needed.

6. Once the vehicle is parked at the yard, report any tools or equipment that need repair to the supervisor. ***Return tools that were removed or borrowed from any other vehicle(s) to the same vehicle(s).***
7. Secure all tools in locking tool boxes, lock boxes and chassis doors.
8. Fill out all daily log reports or information that was not done on site, as needed or required.

17. Emergency Stoppage Removal

When responding to stoppage calls, observe the following protocols;

- Whether during working or off-hours, handle all emergency calls quickly and efficiently. Response time goals are 30 minutes for initial response during working hours and one hour after hours.
- When responding, avoid parking on private drives and use caution when on lawns or easements; use care to avoid unnecessary damage to grounds, shrubbery, landscaping, or property items in the off-road right-of-way.
- On arrival, check the upstream and downstream manhole/sewer main to determine whether the problem is in the DPW main or the customer service connection. If the sewer main appears clear, inform property owner the system is clear.
- If the stoppage is on the customer side, tell the customer to call a licensed plumber or contractor to take care of the problem. Do not, under any circumstances, recommend a specific plumber or other tradesman. DPW does not provide repair or cleaning services to private sewer lines or connections unless it is approved by the responding supervisor.
- If the stoppage is determined to be in the Town sewer main, follow these protocols:
 1. Under typical spill response conditions, one unit will be dispatched to the scene with a field supervisor.
 2. Until the supervisor arrives, the senior operator has “incident command”. The incident commander determines how the spill will be managed.
 3. When possible, make stoppage relief from the dry, downstream manhole. Do not try to relieve the stoppage from surcharged manholes unless all other options have been exhausted. Attempting stoppage relief from flooded manholes is dangerous; if the nozzle does not enter the sewer pipe, it may exit the manhole and cause equipment damage, serious injury, or death.
 4. Install a trap so stoppage cause can be identified if possible.
 5. Once the stoppage starts to relieve, keep water pressure up on the nozzle to keep the hose in place. Retract the hose slightly so the tiger

tail withdraws from the invert, lifting it up and out of the flow to prevent materials from hanging up on its edges.

6. If flow is back to normal close up the job. Determination if further cleaning is necessary is the discretion of the supervisor.
7. Within 24 hours of the event, the pipe is to be CCTV inspected. If CCTV unavailable, a cleaning protocol of two sections upstream and two sections downstream will be followed to ensure the pipe is clean of material.
8. To remove materials from the overflow, wash down the spill manhole and the two manholes upstream.
9. After a spill, at the discretion of the supervisor, check manholes beyond the first two manholes upstream and/or in connecting lines. This can be done during the event or the next working day to ensure that no solids that can cause odors remain in the manholes.
10. If customers or affected property owners ask questions, refer them to the immediate supervisor for further information on claim forms or other matters. Do not, under any circumstance, commit to any corrective action(s) with property owners.
11. Do not, under any circumstance, enter any private structure unless a formal written permission form has been filled out and at the direction of, or in company with, the supervisor.
12. On completion of the work, the responding supervisor will fill out the event paperwork to document the activity, cause, and specifics of the response. Supervisor will contact Department of Environmental Quality (DEQ) within 24 hours of the event and complete the required State paperwork for the event.
13. In all sewer spills (from the Town system), the Director of Public works and Information Officer of the Town must be notified by the supervisor.

D. Equipment Field Safety

For more detailed safety information on the equipment, refer to manufacturer's operation manuals. The following are guidelines that should be followed on each job:

- Always be aware of traffic and safety concerns. When setting up on the street, always follow DPW practice in traffic cone and sign deployment.
- Always wear DPW-approved clothing that is appropriate for weather conditions. Such clothing includes foul-weather gear, footwear, reflective safety vests, gloves, and personal protection equipment, per DPW policy.

- Check vehicle for proper performance of the air/brake system and verify that all emergency lights work.
- Inspect the sewer and vacuum hose regularly. Replace the sewer hose as needed; avoid the use of multiple in-line splices, especially in old or worn hose.
- To avoid hose damage and potential nozzle entry into service connections, avoid using the sewer cleaning hose without the tiger tail or other type of hose protection and finned extensions.
- Do not, under any circumstances, allow anyone to be in the manhole when the machine is in operation.
- Never leave the machine unattended during operation. An operator should be at or near the control panel in case immediate action is necessary.
- When using the vacuum system or decanting water, look for and be aware of overhead obstructions such as electric or telephone wires, tree limbs, building structures, piping, and other obstructions.
- Avoid operating the sewer cleaning hose from a flooded manhole until all other options have been explored. If the nozzle is not in the sewer pipe and exits the manhole under pressure, this practice can be dangerous and can lead to serious injury or death.
- Use the proper tool for the job. Understand how each nozzle works (refer to the Operator's Guide Manual to Flushing Machines) and when it should be used.
- Never use nozzles or accessories on the sewer cleaning hose, on the washdown system, or with the vacuum system which are not specifically designed for that use or approval of the DPW.

1. Maintenance

Perform maintenance of the machine at regular intervals. Many of these requirements are, for the most part, applicable to the combination machines and not to the flush truck(s). Consult the manufacturer's maintenance manual for approximate intervals for the following maintenance tasks:

- Inspect engine oil, filtration, and oil changes.
- Inspect system hydraulic fluid and blower fluid levels.
- Inspect tires (inflation and condition).
- Inspect all emergency lighting and operational lights on the vehicle.
- Grease all reel fittings regularly.

- Oil all counter and control assemblies, which include footage counter rollers and components, control valve stems for pressure, level wind components, and nozzle threads.
- Check all operation gauges, controls, and linkages at the control panel. Remove rust on control arms and other areas frequently with steel wool and apply engine oil lightly on exposed metal areas to reduce rust build-up.
- Inspect glycerin-filled gauges for cracks, leaks, or hazing, and replace the gauges if any are found.
- Check the condition of hydraulic system hoses, especially those exposed to weather. Hoses should be relatively smooth without any major cuts in the surface.
- Inspect regularly, and clean as necessary, the vacuum fan system and water system strainers.
- Inspect nozzles routinely, and clean and oil them regularly. Ensure that all orifices are open and working by watching the nozzle in the manhole inverts. A gauging tool can be used to determine wear, and can be obtained through the nozzle manufacturer at bimonthly intervals.
- Complete and make notes on this as these items and the ones above are reviewed.

8.4 APPLICABLE DOCUMENTS

- A. Permission to Enter Form (SB-1)
- B. Sewer Backup Information Form (SB-2)
- C. Investigation Report Form (SB-3)
- D. Overflow Report (SB-4)