# ATTACHMENT B:

# COLLECTION SYSTEMS MAINTENANCE ACTIVITIES

# Collection System Maintenance Activities

## Mainline Preventive Maintenance and Cleaning Crews

### Purpose

**The purpose of a Preventative Maintenance program (cleaning) is:**

To continually clean the sewer system to provide both uninterrupted service and maximum pipe capacity to convey sewage to the treatment plant for treatment. Additionally, preventative maintenance is used to keep the system clear of debris that could cause blockages or overflows, and to keep the system flowing smoothly in an effort to extend the useful life of the pipe.

### Equipment

Two combination cleaning unit trucks that normally carry 600 ft of cleaning hose, rated at 3000 psi and 25 ft. of black leader hose. The trucks carry approx. 850-1,000 gallons of water to clean sewer lines using a variety of nozzles. Water pressure from the 50 GPM pump propels the cleaning hose up the sewer line to facilitate cleaning. The vacuuming system removes any debris that the cleaning operation brings back to the cleaning site. Material removed from the lines is collected in debris tanks on the truck and disposed of at the treatment plant. These trucks are also used for cleaning Lift Station wet wells. As with any piece of equipment, it is vital to familiarize yourself with the truck operators' manual and with the components of the truck before using.

### Personnel

Two – two man crews. Each crewmember must possess a valid Class B driver's license. Each crewmember is issued personnel protective equipment (PPE) consisting of a hardhat, safety vest, an assortment of safety gloves, ear and eye protection. In addition, uniforms are provided as well as steel toe safety boots.

### Method

The Daly City map is divided or sectioned off into grids. These grids are arranged so that the streets closest to the treatment plant are cleaned first and crews eventually work their way out to the furthest edges of the City, this cycle is then repeated. We strive to complete this cycle so that every line is cleaned every 6 - 12 months. Other line segments have been designated for more frequent cleaning due to heavy usage leading to increased grease or grit. These lines are cleaned three times per year: April, August, and December. In addition, the District provides this service to the Westborough area of South San Francisco, and to the Broad moor/Colma area.

Work orders for the individual line segments are obtained from the City's Muni-Base computer system by the Field Supervisor in charge of the cleaning crews. It is the Field Supervisors responsibility to make sure that their crews have grids printed out and ready to go, and that their crews have all their vehicle and personal protective equipment. The Field Supervisor is also is responsible for accurate recordkeeping and grid map additions and deletions. In the event of an overflow, after initial response and follow up, the line segment is televised to identify any problems. The Field Supervisor then submits a written report containing recommendations to the C&D Manager on what repairs or maintenance schedule adjustments could be made. The C&D Manager then decides what course of action to take.

**Procedures**

1. **When cleaning a line:**
   a. Complete pre-trip vehicle checklist on daily work sheet. Make sure all PPE and work orders are accounted for and proceed to job site.
   b. Utilize all traffic control equipment (cones, beacons, arrow boards, hazard lights) to secure a safe work area.
   c. Position truck at downstream MH as cleaning is normally done against the flow
   d. Before opening MH, test MH for any Hazardous conditions such as oxygen defienciency, flammable or toxic atmospheres. These tests are done using a calibrated multi-gas, gas detector. Once testing has determined that MH is safe, cover can be pulled off using a pick or hook.
   e. Check nozzle and fittings to make sure they're tight. Lower cleaning hose into MH, using cleaning hose guide ("tiger tail"), insert hose into upstream channel. Reset footage counter to zero.
   f. Activate auxiliary engine and let hose fill. Engine idle pressure should remain between 500-1000 PSI. The water pressure will take the hose safely into the pipe.
   g. Once the hose is inside the pipe, pressure can be increased to 2500 – 2900 PSI. Using the hose reel control, hose can than be sent up the line to the next MH.
   h. Visual verification of hose reaching upstream MH is required. This is done by having second crew member at that MH for that purpose. That person will utilize traffic cones and gas detector before opening the MH. Once there is verification, the hose can be wound back to the downstream location.
   i. Effective cleaning is done when the hose is being retrieved. Normal procedure is to reduce hose pressure to approx.2500 – 2600 PSI, and to use less hose reel speed while retrieving the hose.
   j. As the operator rewinds the hose, he will observe flow coming back from the upstream MH. When his partner rejoins him, that person takes over with the hose, while the operator continues to monitor flow and hose controls.
   k. If there is heavy or excessive debris being brought back, cleaning will cease and the vacuum function will be set up. (To be covered later).
   l. When the black leader hose is seen at the MH, decrease water pressure to zero. Remove tiger tail, and slowly rewind hose until it is completely out of the channel. Continue rewinding hose out of MH and secure hose back in its holder.
   m. Wash MH down using water gun, beginning with rim, washing down cone and barrel, then MH shelf and channel. When that is complete, turn off auxiliary engine and return water gun to its holder.
   n. Return MH cover to MH. Make sure cover is on tightly and does not wobble.
   o. Move to next MH and repeat this procedure.

**2. Procedures to be used when vacuuming a MH:**

a. Position truck over MH so that there is room for both the vacuum tubes and cleaning hose.

b. Release vacuum boom from cradle. Test boom response to boom joystick controls. If using remote control pendent, plug pendent into receptacle on front control panel, test controls.

c. Clamp tubes together with adjustable tube clamps, lower tubes into MH and rest tubes on MH shelf.

d. Lower boom to tubes, clamp together with tube clamp.

e. Raise tube off shelf and position above channel approx.2-3 inches, as close to the downstream outlet of MH as you can get.

f. Engage vacuum control, yellow handle, located behind cleaning hose reel.

g. Turn on vacuum and blower switches on control panel on front reel, put hearing protection into place.

h. Increase RPM to 2200 using the throttle switch located under the blower switch on the control panel. At this point you're removing liquid and debris from MH into truck debris tank

i. Initiate cleaning procedure. While cleaning line monitor tank level indicator on side of debris tank. Continue cleaning line until there is no more debris.

j. Decrease RPM to normal idle, turn off blower and vacuum switches and disengage vacuum control.

k. Unclamp boom from tubes and use handgun to wash interior and exterior of tubes while they are still in MH. Remove cleaning hose and tubes and secure them back on truck.

l. Return MH cover to MH. Make sure cover is on tightly and does not wobble.

m. Secure boom into boom cradle. Pick up cones, truck is now ready to leave site.

**3. To Chain Flail a Line Segment:**

A chain flail is a nozzle with three sets of chain that spin using water pressure to cut roots. It also has six jets to propel it up the line and to move debris. The chain length is adjustable depending on which size line is to be cleaned. 7 links for 6" pipe, 9 links for 8" pipe and 11 links for 10". To clean a line using this nozzle, follow the steps as outlined above in the cleaning procedure section with the following additions.

a. Before lowering cleaning hose into MH, remove rubber ball skid that separates leader hose from nozzle. Attach nozzle directly on to leader hose.

b. Once hose is in line, and water pressure is increased, listen for loud humming sound. This means nozzle is spinning and can be sent up the line.

c. Upon completion of cleaning operation, inspect chain for wear points and chain screws for tightness.

d. Remove nozzle and lubricate. Wrap in clean rag and store in tool box.

**4. Decanting and Dumping:**

To empty debris tank, the first step is to decant excess water. This can be done at any trunk line but the two best locations are on North Mayfair Ave (MH #122, Grid C-4, 21" line) or Palmcrest Ave (MH # 153, Grid C-5, 30" line). Both are close to the plant. To decant and dump,

a. Set up traffic control around MH

b. Position rear of truck above MH

c. Test MH with gas detector, open MH

d. Insert hose from debris tank door in MH

e. Open drain valve, lift tank and drain water in MH. Lift tank all the way up and drain as much water as possible

f. Return tank to down position and close MH. Re-wrap and hang hose back on tank door. Close drain valve.

g. Pick up traffic control, proceed to plant.

h. Once at the plant, position rear of truck above MH # 128, located by Paint Booth.

i. Test MH with gas detector, open MH.

j. Open tank door locks slowly, let debris drain into MH.

k. Raise tank slowly until it is completely up. Wash tank and tank door thoroughly. Lower tank down to original position. Secure tank door locks

l. Pull truck forward, sweep and wash any debris into MH.

m. Close MH

**5. Customer Response & Lift Station Maintenance:**

a. The Customer Service/Response crew starts out with stretching at the start of every morning. That goes from 07:00 am till 07:15.

b. 07:15 till 07:30 is when the crew checks the response van, filling out the daily check sheet and going over inventory.

c. After completing the truck check, the crew checks the SCADA System (Supervisory Control and Data Acquisition) to check the status of the Lift Stations. SCADA is a Station Monitoring System that gives real time status of the conditions of the Lift Stations.

d. The Response Crew will meet with the Field Supervisor to go over any special details that may need to be taken care of for the day.

e. The Response Crew is responsible for Lift Station Maintenance on Mondays and Thursdays.

    1. The crew checks the hour meters on the pumps to make sure there is alternation between the pumps; and,

    2. Check and wash down the wet wells; and,

    3. Operate the sump pump; and,

    4. Check the Rotometers for the seal water; and,

    5. Maintain the grounds.

f. USA Markings (Underground Service Alert)

USA tags are given to the crew by the Field Supervisor at the beginning of the shift and throughout the day.

g. Customer Service Calls

The crew also responds to Customer Service Calls. A customer service call is normally a call that is a sewer back up in the garage. The main sewer in the street is the City of Daly City's responsibility and the lateral is the homeowner's responsibility.

1. The mainline is checked first to make sure it is flowing.
2. The crew will then meets with the resident and explain the responsibility of the City and the responsibility of the homeowner.
3. They will also give the resident a copy of the City Of Daly City Sewer Lateral Maintenance Policy, and a F.O.G. Notice. (Fats, Oils, and Grease)
4. They will explain to the resident the service that we provide, which is a one time service that they can accept or decline. If it is determined that the lateral is plugged, the crew will snake out the lateral all the way to the mainline, and then televise and locate the problems with the lateral. The owner is then given a Notice to Repair that they are requested to sign. The report and the video is handed over to the Field Supervisor of the Response Crew who views the video,, makes recommendations to the owner, and the address is added to the" Hot Sheet". The Hot Sheet (Check Mainline Only) is a list of addresses that we have responded to and made recommendations on how to remedy their problems, and that information is forwarded to the Source Control Inspector for enforcement. Preventive Maintenance on the sewage lift stations is also the responsibility of the Customer Service/Response Crew. Every month they complete approx. 80 work orders to make sure the lift stations operate in an efficient manner. The Response crew also assists the Rehab Crew when needed with repairs and traffic control for the Preventive Maintenance Flushing Crew.

**6. Manhole Rehabilitation & Pipeline Construction – Rodding, Root Control & Abatement Crews Daily Functions:**

a. 7:00 to 7:15 stretch time. Crews are provided 15 minutes to stretch.

b. Vehicles are checked out and information documented on the daily truck inspection form.

c. Crew meets with Field Supervisor and are given their assignments

d. 7:30 a.m. Crews prepare for daily assignments.

**A. Construction job procedures for a typical dig:**

**1. USA markings**

a. Calling in request.

b. Log into the USA list on the G-drive under construction crew

2. **Setting up traffic safety utilizing all cones and traffic signs**.
    a. Confirm USA markings by the utilities
    b. Saw cut the job utilizing a shop Vac or Vac-Con for containment of slag.
    c. Clean jobsite of any slag remaining
    d. Remove all cones and signs

3. **Sketch out the details of the jobsite noting sign placement for vehicle and pedestrian safety**

4. **Tools, equipment, and personal needed for the job estimate for completion**

5. **Posting of no parkers and notifying affected residents of construction activities.**
    a. Notify police and the fire dept. if there will be any restrictions to traffic or street closures.
    b. Traffic control plans should be written out and discussed with the Lead prior to the start of the job.
    c. Post No Parking signs at least 48 hours before the job begins.

6. **Getting started the day of the repair insuring you have everything you may need to complete the repair.**

7. **The crew assignment for the repair. Who digs, who repairs, who transports spoils and equipment**.

8. **Excavation and shoring**

    Follow all State and Federal regulations regarding the placement and use of hydraulic shoring in all trenches and construction excavations

    .

9. **Repair and installation of the new pipe**.

    Follow NSMCSD requirements for pipe type and couplings.

10. **Dye test and backfill.**
    a. Dye test from the upstream manhole from the repair and insure there are no leaks and that the dye reaches the downstream manhole.
    b. Hand backfill under the haunches of the pipe and compact using the back of a shovel before the shoring is removed.
    c. Mechanical compaction of backfill material and base rock should be performed every two feet.

11. **Cutback or plate**
    a. Determine in advance whether you will utilize a street plate or you will use cutback to secure the excavation
    b. Contact Bay Area Paving Co. and inform them of hole location and size
    c. If the hole was plated we will need to remove the plate on the day the paving will occur. This will be coordinated with the contractor.
    d. If the hole was filled using cutback, the contractor will remove the cutback prior to paving.

**B. CCTV**

**Video Inspection Truck Standard Operating Procedure**

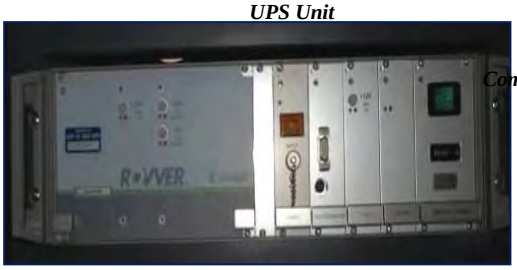
The video inspection operation consists of a main control operator and a rear control operator. The two will work in relation with the Collection System Field Supervisor as to the assigned areas to be inspected. Once assigned areas have been designated for video inspection, the main control operator and rear control operator will check grid map for structure identification and size of pipe prior to entering the field.

**Pre-Inspection Check:**

The main control operator will ensure shore plug is connected to an alternate current (AC) source and in the operating room the shore selector switch is selected. This will provide energy to the crawler and all the electronic components in the operating room as well as in the rear of the truck.

The next step is to engage the Eaton Powerware uninterruptable power supply (UPS) by holding down the power button. This will allow for the operator to turn on the computer and the camera control unit.

***UPS Unit***



***Computer***

***Thing a ma jig***


***Camera Control***

The main control operator will turn on camera control to send power to the crawler. The main control operator will work with the rear control operator to check lights on the illumination ring, or send controls back to the rear by turning the control dial to the external position from the operator's room. *Note: Before turning on camera control, make sure the throttle dial on the pendant is turned all the way to the (-) negative position.*


***Rover Control Switch***

The rear control operator will check the tractors illumination ring (lights) and pressure. Pressure must be checked every time the Video Inspection truck enters into the field. Light indicators will determine if the crawler needs to be pressurized or not. The head of the camera and the body of the crawler have LED indicator lights for this purpose. An adequate pressure for the crawler is between 5-10psig. The light indicators will provide a solid green light when this pressure is met. A solid red light means that the pressure is over 10psig, so pressure will have to be released until the green light appears. The blinking red light however indicates that there is not enough pressure and that the pressure is below 5psig and the system needs to be pressurized.

*Thing a ma jig*

Pressurizing the camera head and the crawler will be done using dry gas (instrument air, nitrogen, or argon). The instrument to the left will be used to perform the pressurization of the camera head and crawler. In line ports are located on the head as well as the camera body to introduce the dry gas. Use the pressure regulator to set the instrument to 10 psig and use the light indicators on the camera head and crawler to determine need. Once all the pre-inspection checks have been completed the rear control operator will secure crawler in place and any other items that may shift during transit.

The main control operator will safely turn off all electronics and turn the selector dial to the off position. The key board, mouse and pendant control must be secured safely so that they will not be damaged during transit. ***Note*: Properly shut down the (PC) personal computer, before attempting to drive the vehicle, damage to the computer's hard drive is highly probable!**


***Fuel Pump Selector Dial***

**Arriving in the field:**

Prior to entering the designated area both operators should have the knowledge of the specific location of the inspection and the size of the pipe being inspected.

**Driver and Passenger Responsibility:**

***Traffic Control Setup***

Arriving at the purposed location, the passenger safely exits the vehicle and sets up cones to safely delineate traffic. The driver will set the light bar to instruct traffic in a safe direction. The passenger will guide and position the driver so that the left rear of the vehicle is positioned approximately two feet from the back of the truck.

Once the job site has been secured the passenger, control operator will turn the fuel pump selector dial to the on position, which is located in the rear of the vehicle, below work bench.


***Camera Control***

***Generator***

The passenger/rear control will then start the generator on passenger side of the vehicle. ***must be checked daily.*** Once turned on, a vent tube is placed exhaust facing down wind.

***Vent Tube***

operator the rear ***Note: Oil*** generator is on the

Main control operator will then turn selector dial to the GEN position so energy can be utilized for all components.


***Fuel Pump Selector Dial***

**Rear Control Operator:**

Before any work is performed the atmosphere must be tested in the manhole structure. Once it has been deemed safe, safely remove cover. Make sure video inspection cable reel selector dial is in the stop position. Pull enough cable from the cable reel so that the crawler will sit in the channel.

Use enough rope, which is attached to cable protection guide and place rope around base of camera neck. Safely lower crawler into manhole channel utilizing cable and rope. Place the cable reel dial in the automatic (A) position.


*Rover Remote Control*

Use the rear control pendant to engage crawler to move forward. Move the right directional toggle switch up and a green light will indicate crawler direction. Next, turn the black dial with the green tractor icon clockwise towards the plus (+) symbol until knuckle of tow cable enters into mouth of pipe. Remove any slack that is left in the cable by placing cable reel selector dial in the (M) manual position. Lower the cable protection guide until it partially enters into the mouth of the pipe. Take the rope attached to the cable protection guide and tie it off to the removable step. Place cable reel dial into the (A) automatic position and maneuver crawler cable inside of the cable roller guide, which is then placed on top of the manhole. Reset footage counter on cable reel and notify main control operator that the crawler is ready to proceed.

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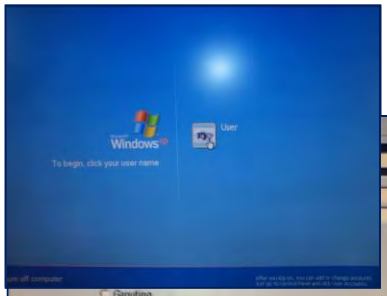
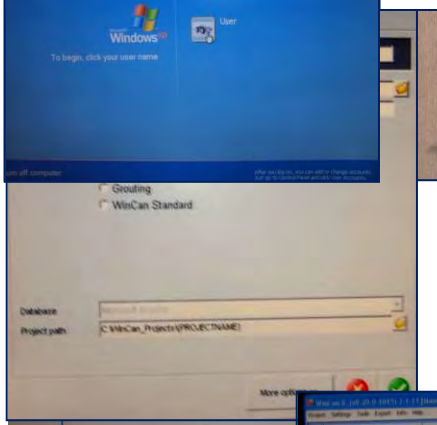
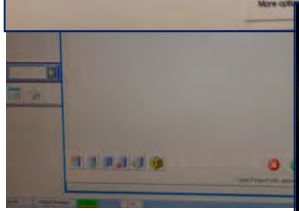
**Main Control operator:**

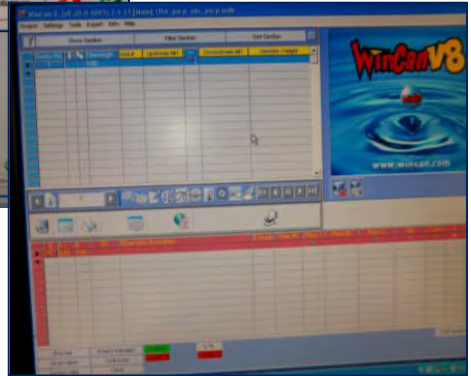
Once the crawler is ready to perform the (UPS) unit, which is in power button on the upper right corner of the operating room facing the crawler cable reel. Next, press the power button for the camera control and lastly turn the computer on.

Once the computer has gone through its start up process, navigate mouse cursor to the user icon and double left click the mouse.






A visual of the computers desk top will be displayed. Locate the WinCanV8 icon, which is in the upper left part of the screen and double left click with the mouse. This will take the operator to the Project Manager screen where user name and password is required. After the required user name and password has been input, double left click mouse on the green check mark. The Project Manager screen will be displayed and a new project will need to be created. To create a new project, double left click mouse cursor on the cylinder with the explosion at the bottom left of the screen. The operator will numerically type in the, month/day/year in the Project Name section and double click the green check mark to proceed.

This will take the operator to the WinCanV8 project screen where the operator can create section data. Navigate arrow to Section No. 1 and double left click on the blue highlighted area, or press F4 manually input section data.

to

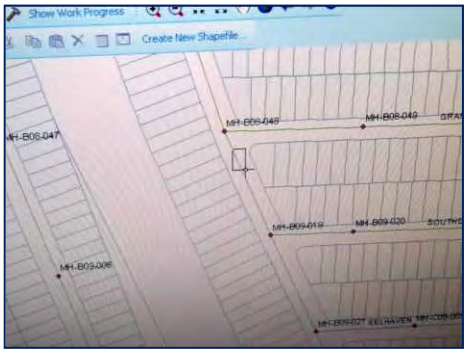
Attachment B

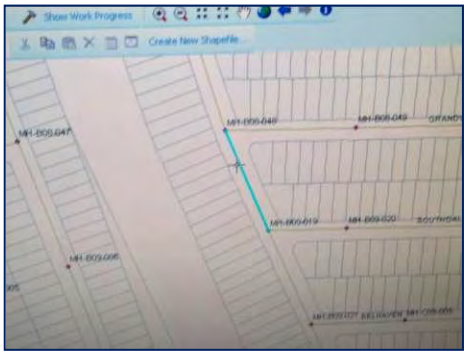
The data fields that are required before inspection are in yellow. Though typing in the section data manually for grid, upstream manhole, down stream manhole etc… are required in some instances, such as: Town of Colma and Westborough. **The City of Daly City Sanitary Sewer Mapping System on WinMap will be used prior to any inspection**. It is extremely important to use this tool as it supports the population of inspection data.

**Accessing WinMap:**

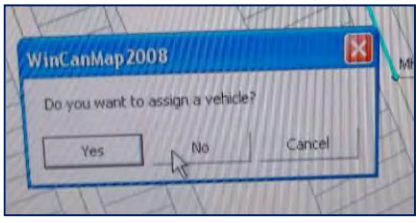
Once the project and section screen is displayed, navigate mouse cursor to the world icon with Mapv8 and double left click. 
WinCanMap 2008 will be displayed at the top left of the screen. Navigate to the file drop down menu at the top left of the screen with mouse cursor and single left click so that drop down menu will be displayed. Scroll down and select <open>. The Open Map document will be displayed. *Note: if the text bar at the top of the screen does not read Look in: WinCan SHP Files, then the next step is to locate file from the C: drive and double left click on WinCan SHP.*

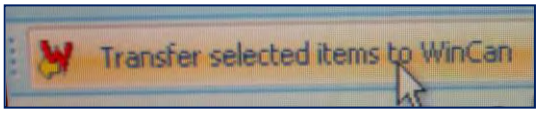
Once these steps have been met, double left click dalycitymap.mxd. The map page will be displayed and data transfer from the mapping system to WinCan can now start the beginning process. Locate this icon at the top middle of the screen and single left click mouse. The arrow will then become a compass as it enters into the mapping screen. Left click mouse and drag compass between two points on the map by holding down the left button of the mouse. Release left button on the mouse and the section will become highlighted blue. 





Next, go back to the top left of the screen and locate **transfer selected items to WinCan** and double left click with mouse. A screen prompt will come up and ask, do you want to assign a vehicle, with the mouse single left click no.




The project screen with the section just transferred will come up. Check structure identification to make sure that proper line segment has been transferred. Double left click mouse on section number desired, or press F4 on the keyboard, so that the section data field can be filled out. Data fields that are in yellow are mandatory and must be completed. After all mandatory data has been entered; double left click mouse on the green check mark located in the middle of the screen.

**Camera Heads:**

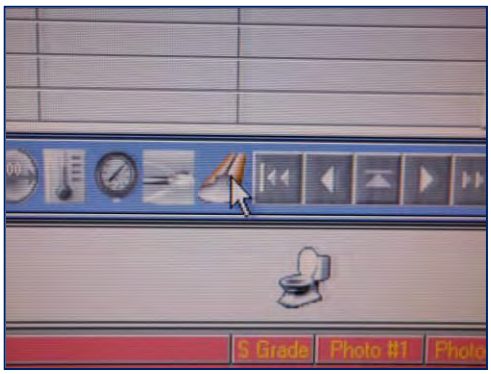
WinCan is set and ready to capture data; however, there are two types of camera heads that will work in relation with our WinCan software which are: Pan and Tilt and Digisewer.

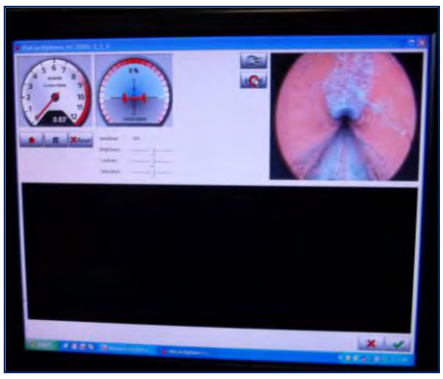
**Pan and Tilt** **Digisewer**

To use the **Pan and Tilt** use the text generator keyboard, which is above the camera control unit. Lower the white keyboard to the desk and hold down the keyboard keys: shift, shift, control N. Turn off power to the camera control unit, then turn it right back on. This will synchronize WinCan with the pan and tilt head, which is set for live streaming video.

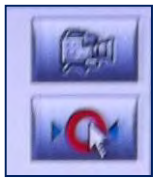
To use **Digisewe**r the same method is used, however on the text generator keyboard press: shift, shift, control P.

**Using Digisewer:** Double left click the Digisewer icon with the mouse cursor. The Digisewer screen will then be displayed.



Double left click with mouse cursor on the calibration icon located in the upper right corner of the Digisewer screen. The calibration screen will then be displayed. Type in the size of pipe to be calibrated. The object for calibration is to center pipe joint in the area. The tools in the upper screen will assist with this process.



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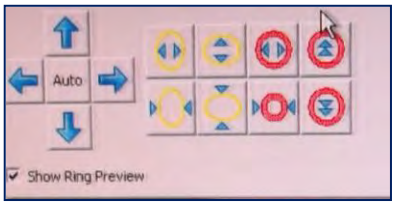
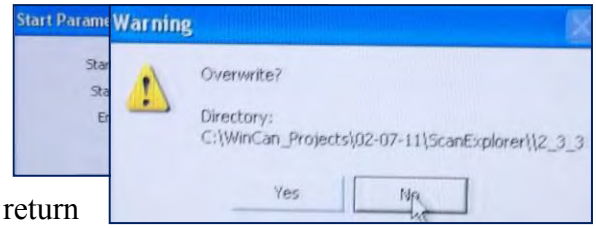



After successful calibration double left click blue disk in the upper right corner of the screen to save the calibration for that particular pipe size. Then double left click mouse cursor on the green check mark to exit the calibration screen. *Note: Make sure that WinMap is closed*

*prior to using Digisewer.* A successful calibration is a semi straight line of the pipe joint, which will be displayed to the right of the calibration screen.


return Digisewer is now ready to scan. To begin scan, single left click with the mouse cursor on the record button on the left of the screen. The start parameters prompt will then be displayed. Type in zero and hit and Digisewer will begin capturing data when crawler begins moving forward down pipe segment. After line segment has been scanned through its entirety, double left click green check mark and data will begin to store onto the computer. Once complete a screen warning prompt will ask to overwrite data, single left click with mouse cursor, **NO** and the scan will be saved to that particular section in the WinCan Project.


**Pan and Tilt:** Double left click mouse cursor on camera icon in the WinCan project section. This will enable the camera to capture streaming video. To begin capturing streaming video double left click the clip button in the observation section of WinCan. The record feature will display and double left click the record button and streaming video will be captured. *Note: Pan and tilt will only be used for a single inspection.*

**Retrieving Crawler:** Once the scan or observation has been completed the control room operator can bring crawler all the way back to the starting position, or turn the control dial to the rear, so the rear control operator can retrieve the crawler.

Rear Control Operator: Before retrieving the crawler make sure that tension control dial is turned all the way to the right.

The operator control room pendant and rear control pendant have the exact same functions. To engage crawler to move in reverse, move the right directional toggle switch down and a green light will indicate crawler direction. Once the crawler has been engaged to move in reverse the cable reel will automatically begin to remove slack from the cable. Once all the slack is removed then it is safe to engage tractor to move in reverse.

If tension control dial is not set all the way to the right the crawler WILL back over the cable. Next, turn the black dial with the green tractor icon clockwise towards the plus (+) symbol. This will control the speed of the crawler. Bring back crawler at a moderate speed! Watch video screen and cable reel simultaneously for any sudden changes that may occur. Also be cognizant of footage counter as this will assist in determining when to stop the crawler. Note: Although the crawler can be stopped by the black dial with the green tractor icon, the reel will still be engaged causing the crawler to be pulled backwards.

It is important to pay attention during this time because the cable reel will pull crawler out of the manhole channel, potentially causing serious damage to the camera head. Place the cable reel in the stop position, or push the right directional toggle switch up to engage crawler to go forward, this will prevent reel from continuing in reverse.

Do not return crawler at maximum speed, returning crawler at maximum speed may cause crawler to roll over cable potentially causing serious damage.

Note: If the truck is set up perpendicular to a manhole when video inspecting a line segment, retrieval of camera will have to be done carefully and slowly.

Once the crawler is approximately two feet from the mouth of the pipe when retrieving, turn the black dial with the green tractor icon counter clockwise towards the minus (-) symbol until the crawler stops. Immediately

place cable reel in the stop position. Engage crawler once again by moving the right directional toggle switch down and slowly turn the black dial with the green tractor icon clockwise towards the plus (+) symbol. This method will only activate crawler wheels so the remaining slack will have to be brought back by rear operator. Return crawler to the center of manhole and remove the protective manhole roller and cable protection guide from manhole. Place cable protection guide on the side of the manhole and use the rope from the guide to assist with the removal of crawler. Take two sides of the rope from the cable protection guide and lower rope down underneath base of camera head and pull up simultaneously with cable. Be sure that crawler is placed safely away from open manhole. Thoroughly wash crawler and wheels with water hose, which is directly left of the cable reel after each removal of crawler.

Place manhole cover back on and retract cable into reel. Put the cable reel into the manual position and turn the first dial to left of selector dial to the rabbit until excess cable is wound up.

Once the computer is shut down and all auxiliary equipment, then turn off fuel pump and generator and safely remove cones and signs.

**C. Root Abatement**

1) **Rodding**
    a. Set up proper traffic control following procedures for the Flusher truck
    b. Set up the Rodder at the upstream manhole and rod the line utilizing a spear or corkscrew tool to the downstream manhole.
    c. Remove the tool at the downstream manhole and install a root saw sized for the pipe size.
    d. Slowly rod the line from the downstream manhole to the upstream insuring that no roots get by the downstream manhole using a stick grabber or shovel in the channel.
    e. Remove the root saw and rod from the upstream manhole.
    f. Televise the line utilizing our CCTV truck to insure line was cleaned properly. If there are roots still present in the line segment coordinate with the CCTV truck to observe the rodding operation.
    g. **EXTREME CAUTION MUST BE UTILIZED DURING THIS OPERATION TO INSURE THE SAFETY OF THE CCTV CAMERA.**

2) **Chainflail**
    a) See flushing procedures.

3) **Chemical**
    a) Foaming of the lines is currently performed by contract by Dukes Root Abatement. Line segments are foamed every other year.

4) **Spot Repair**
    a) See Construction and Repair procedures

**Standard Operator Procedure: Pneumatic Pipe Plug**

To begin the process of utilizing a pneumatic pipe plug:

Locate the yellow and black tool box in the tool lock-up room at the Plant, which has air fittings, gauges, ball valves, and regulators. The tool box is also equipped with (2) adjustable wrenches, Teflon tape and (3) complete regulator, gauge, and ball valve set-ups.
Inspect the (3) set-ups to ensure that they are functioning correctly and no visible problems exist.

Locate portable air tank, which is also located in the tool lock-up room at the Plant. Inspect the tank integrity and gauge prior to filling the portable air tank from an external air source.

Note: Each portable air tank will have an expiration date stamp, once the portable air tank has reached its life, a new tank will need to be acquired.

Put safety glasses on when filling the portable air tank. The portable air tank has an in- line valve that can be opened and closed. Open the in-line valve and fill air through the same port from and external air source. Fill portable air tank to 100 PSI. Danger: DO NOT FILL PAST THE MAXIMUM LEVEL, serious injury may occur.

After safety checks and filling of the portable air tank has been completed, reference grid map to determine pipe size that will be plugged. Once the size of the pipe has been determined, locate the proper pneumatic pipe plug at Westlake yard and also (2) air supply lines.

The pneumatic pipe plug size will vary. Check the range to ensure proper pneumatic pipe plug size and Maximum PSI. These features will be located on the face of the pneumatic pipe plug. Inspect air supply lines and pneumatic pipe plug for wear and tear.

Once the Maximum PSI on the pneumatic pipe plug has been established, place the regulator, gauge, and ball valve set-up on the portable air tank. Utilize the gauge on the set-up, close valve and adjust regulator to 2 PSI below the maximum pneumatic pipe plug level.
Insert air supply line to portable air tank and pneumatic pipe plug. Shackle pneumatic pipe plug insertion pole to pneumatic pipe plug. Completely insert pneumatic pipe plug inside pipe.

Open ball valve on gauge and regulator set-up slowly to inflate the pneumatic pipe plug to the desired PSI. Once inflated, periodically check gauge on regulator and gauge set-up and as well as the tank gauge for loss of pressure. Make adjustments accordingly. Note: Portable air tank can be filled when pneumatic pipe plug is being utilized.

*Safety First: Keep body out of the way of a pressurized pneumatic pipe plug! Serious General Standard Operating Procedure

**Sanitary Sewer Overflow (SS0) On-site Initial Assessment & Work Performance**

1. Identify
2. Time
3. Photo
4. Notify Supervisor
5. Call for Assistance
6. Check Grid Map
7. Clear Blockage
8. Time
9. Capture
10. Clean-up