

SECTION 02733

CLEANING AND TELEVISION INSPECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cleaning the sewer (common term for all sizes of storm and sanitary) lines to remove debris, solids, roots, sand, pieces of broken pipe, bricks, grease, and grit from all sizes of storm sewers (pipes and boxes), junction boxes, inlets, leads and trunk lines, manholes, all sizes of sanitary sewer lines (mains, services and trunk-lines), cleanouts, junction boxes, and manholes, thus improving flow and facilitating television inspection for sewer evaluation. Cleaning includes the initial washing by high-pressure water jet at storm sewers (pipes and boxes), junction boxes, inlets, leads and trunk lines, manholes, all sizes of sanitary sewer lines (mains, services and trunk-lines), cleanouts, junction boxes, and manholes.
- B. Televising the line to obtain quality DVD's and TV inspection reports upon which the Owner's Representative can make a decision regarding needed cleaning, sewer rehabilitation and repair, lining or replacement by trenchless methods.

1.02 UNIT PRICES

- A. Cleaning Using Normal Cleaning Equipment. Measurement for cleaning lines (pipes and boxes) with normal cleaning equipment is on a linear foot basis. The Contract unit price bid for cleaning with normal equipment is full payment for lines actually cleaned and accepted. Cleaning using normal cleaning equipment includes:
 - 1. Charges for transient water meter setup and water usage.
 - 2. Collection, removal, transportation, and disposal of sand, debris, and liquid wastes to legal disposal sites.
 - 3. Locating, exposing, and opening the manholes on sewers to be cleaned.
 - 4. The initial washing with high-pressure water hose. Payment for additional cleaning and scrubbing of manholes, inlets and junction box walls which may be required for its rehabilitation is included in the unit price for wall sealing as specified in Section 02764 Manholes, Inlets and Junction box Rehabilitation.
 - 5. Reconstruction of manholes, inlets and junction boxes which are dismantled for access of cleaning equipment, and repair of any damages caused by the dismantling or cleaning equipment.

- B. Cleaning Using Mechanical Cleaning Equipment. Measurement for cleaning sanitary sewer mains, storm sewer leads and laterals, main trunk-lines (pipes and boxes) with mechanical cleaning equipment is on a linear foot basis for the quantity approved by the Owner's Representative. The Contract unit price for cleaning sanitary and storm sewer mains, leads, laterals, pipes and boxes with mechanical cleaning equipment is paid in addition to the unit price for cleaning using normal cleaning equipment. Cleaning using mechanical cleaning equipment includes:
1. Collection, removal, transportation and disposal of sand, debris, and liquid wastes to legal disposal sites regardless of quantity of material.
 2. Locating, exposing and opening the manholes, inlets and junction boxes on lines to be cleaned.
 3. Reconstruction of manholes, inlets and junction boxes which are dismantled for access of cleaning equipment and repair of any damages caused by the dismantling or cleaning equipment.
- C. Mechanical cleaning is limited to locations approved by the Owner's Representative on a case-by-case basis after normal cleaning methods have failed to produce satisfactory results, as determined by viewing DVDs.
1. Mechanical cleaning prior to normal cleaning does not relieve the Contractor of the responsibility of fully cleaning the pipe with normal cleaning equipment.
- D. Survey TV Inspection. Measurement of survey TV inspection for pipe segments selected by the Owner's representative is on a linear foot basis from the centerline to centerline of manholes. Payment for survey TV inspection is made for the actual lengths of TV inspection footage, as measured in the field at grade as submitted for evaluation prior to final recommendations of sewer rehabilitation method.
1. No payment will be made for poor or unacceptable quality DVDs or mp4s. Hazy, unclear pictures will not qualify for payment.
 2. No payment will be made for re-televising any segment without prior approval of the Owner's Representative.
 3. No payment will be made for portions of lines (pipes and boxes) not televised. No payment will be made for linear feet of lines (pipes and boxes) through which the camera could not pass. Dewatering (no separate pay) if required to obtain good quality DVDs or other acceptable formats in good quality such as mp4 is subsidiary to the TV inspection.
 4. No payment will be made for reverse setups required to bracket an obstruction.

5. No separate payment shall be made for line (pipes and boxes) flow control.
- E. Survey TV Inspection by Floating Camera. Measurement of survey TV inspection by floating camera for pipe/box segments selected by the Owner's Representative is on a linear foot basis for actual footage televised from the centerline to centerline of manholes, junction boxes or inlets. The inspections may be required in 36-inch through 84-inch-diameter sewer pipes, small or large boxes, without any cleaning, for purely investigative studies. Payment for television inspection by floating camera shall be made based on a separate bid item for floating camera.
- F. Pre-Installation TV Inspection. No separate payment will be made for pre-installation TV inspection, including cleaning, except for lines inspected but not rehabilitated. Include cost for pre-installation TV inspection in the cost of line work for which the rehabilitation effort is performed. If a line is inspected and found, in the opinion of the Owner's Representative, to require no rehabilitation work, the Contractor will be paid for pre-installation TV inspection on the basis of survey TV inspection, and cleaning on the basis of normal mechanical cleaning.
- G. Post-Installation TV Inspection. No separate payment will be made for post-installation TV inspection. Include cost for post-installation TV inspection in the cost of line work for which the rehabilitation is performed. The post-installation TV inspection tape policy allows payment for work based on the field measured lengths indicated on the inspector's daily reports, but still requires the Contractor to submit a post-installation TV tape within one calendar month after the segment was completed. If no tape is received within that period, credit for the previously paid line segment will automatically be deducted from pay estimates in following months until the required tape is submitted. If, after review by the Owner's Representative, the post-installation TV tape is disapproved, the Contractor shall repair the identified defects, reteleviser the entire line segment and submit a post-installation TV tape of the repaired line segment. This work shall be done at no additional cost to the Owner. If post-installation TV tape is disapproved pay may be deducted.
- H. Footage paid for cleaning, under some circumstances, may exceed the footage paid for televising, as approved by the Owner's Representative.

1.03 DEFINITIONS

- A. Normal Cleaning Equipment. Cleaning devices such as rods, metal pigs, porcupines, root saws, snakes, scooters, sewer balls, kites, and other approved equipment in conjunction with a hand-wincing device and gas or electric rod-propelled devices. Variable pressure water nozzles, (3000 psi) are considered normal cleaning equipment.
- B. Mechanical Cleaning Equipment. Buckets, scrapers, scooters, porcupines, kites, heavy-duty brushes, metal pigs, and other debris-removing equipment and accessories

used in conjunction with an approved power winching machine. High to very high-pressure water nozzels (10,000 psi) are considered as mechanical cleaning equipment.

- C. Survey TV Inspection. Survey TV is a video inspection of existing pipes, boxes, leads/laterals, etc., to evaluate lines and determine if conditions exist which will require line rehabilitation.
- D. Pre-Installation TV Inspection. Pre-installation TV is a video inspection by the Contractor of lines (pipes, boxes, leads/laterals) specified for rehabilitation to confirm cleaning, location of service connections, and constructability of line rehabilitation according to Drawings and Specifications.
- E. Post-Installation TV Inspection. Post-installation TV is a video inspection to determine that rehabilitation of (pipes, boxes, leads/laterals) has been completed according to Drawings and Specifications.
- F. TV Inspection Report. A form that is filled out by each TV inspection for any DVD that is submitted to the Owner. Form provided by the Owner's Representative.

1.04 PERFORMANCE REQUIREMENTS

- A. Clean the designated lines (pipes, boxes, leads/laterals), junction boxes, inlets, and manholes using mechanical, hydraulically propelled, or high-velocity sewer cleaning equipment. Select a cleaning process which removes grease, sand, silt, solids, marine growth, rags, and debris from each line (pipes, boxes, leads/laterals) segment and associated manholes, inlets and junction boxes.
- B. The Owner's Representative may determine that no additional line rehabilitation work is required if the cleaning operation shows the line to be free of damage or deterioration. The Owner's Representative may delete from the project, any or all of the lines which do not show the need for rehabilitation.
- C. If, after Pre-Installation TV Inspection, the Contractor determines that the existing line condition is such that, in his judgment, the specified rehabilitation method would be ineffective or not constructable, he should notify the Owner's Representative in writing. The Owner's Representative will determine what rehabilitation method should be used and notify the Contractor in writing.

1.05 SUBMITTALS

- A. Make submittals in conformance with all provisions and sections of these specifications.
- B. Submit the equipment manufacturer's operational manual and guidelines to the Owner's Representative for review. Strictly follow such instructions unless modified by the Owner's Representative.

- C. Submit a list of legal disposal sites proposed for dumping debris from the cleaning operation.
- D. Submit and maintain a Liquid Waste Manifest conforming to the Owner's requirements. Send the Owner's and Regulator's copies of the completed manifest to the Owner's Representative monthly.
- E. Submit DVD and TV inspection reports to the Owner's Representative for review.
 - 1. Provide DVDs of a quality sufficient for the Owner's Representative to evaluate the condition of the lines (pipes, boxes, leads/laterals), locate the leads/laterals and service connections, and verify cleaning. If quality is not sufficient, Contractor shall re-televiser the Storm and Sanitary Sewer segment and provide a new tape and report at no additional cost to the Owner. Camera distortions, inadequate lighting, dirty lens, or blurred/hazy picture will be cause for rejection of a tape and rejection of the associated line segment.
 - 2. DVDs and mp4s submitted become the property of the Owner.
 - 3. Contractor shall maintain a master copy of all DVDs and mp4s and TV inspection reports submitted, until final acceptance of the work.
 - 4. Transmit each TV Inspection Report to the Owner's Representative with a Transmittal Form. Copies of the TV Inspection Report form and Television Inspection Codes Summary are attached.

1.06 QUALITY ASSURANCE

- A. Qualifications. Use experienced personnel to operate cleaning equipment and devices.
- B. Acceptance of lines (pipes, boxes, leads/laterals) cleaning work is contingent upon the successful completion of the television inspection. If television inspection shows debris, solids, sand, grease, marine growth or grit remaining in the line, the cleaning is considered unsatisfactory. Repeat cleaning, inspection, and televising of the sewer line until cleaning is acceptable by the Owner's Representative.
- C. For reporting overflow or spillage of stormwater and wastewater, refer to Section 01500 - Temporary Facilities and Controls.

PART 2 PRODUCTS

2.01 CLEANING EQUIPMENT

- A. Select the cleaning equipment and method for cleaning, based on the condition of the lines (pipes, boxes, leads/laterals) at the time work begins. More than one type of equipment or attachments may be required on a single project or at a single location.
- B. When requested by the Owner's Representative, demonstrate the performance capabilities of the cleaning equipment and method proposed for use on the project. If results obtained by the demonstration are not satisfactory, provide other equipment or devices that will clean the lines (pipes, boxes, leads/laterals).
- C. For cleaning equipment, install a gauge to indicate working pressure on the discharge of high-pressure water pumps. In addition to conventional nozzles, use a nozzle which directs the cleaning force to the bottom of the pipe for sewers 18-inches and larger.
- D. When cleaning equipment is used, install a suitable sand trap, weir, dam, or suction in the downstream manhole so that solids and debris and marine growth are trapped for removal.

2.02 CLEANING ACCESSORIES

- A. When an additional quantity of water from the public water supply is needed to meet the cleaning requirements of the equipment and the lines (pipes, boxes, leads/laterals), obtain transient water meters from the local authority for installation on the trucks or at fire hydrants.
- B. All cleaning equipment must be equipped with a backflow preventer to prevent any contamination to the public water supply.

2.03 TELEVISION EQUIPMENT

- A. Closed Circuit TV Equipment. Select and use closed-circuit television equipment that will produce a color DVD and mp4.
- B. Pipe Inspection Camera. Produce a DVD and mp4 using a pan-and-tilt, radial viewing, pipe inspection camera that pans ∇ 275 degrees and rotates 360 degrees. Use a camera with an accurate footage counter which displays on the monitor the exact distance of the camera from the centerline of the starting manhole, inlet, and junction box. Use a camera with camera height adjustment so that the camera lens is always centered at one-half the inside diameter, or higher, in the pipe and box being televised. Provide a lighting system that allows the features and condition of the pipe and box to be clearly seen. A reflector in front of the camera may be required to enhance lighting in dark or large diameter pipe and box.
- C. DVD. Provide DVD and mp4, recorded at Standard Play (SP).
 - 1. Only line segments from the same basin shall be included on a DVD and mp4.

2. One or more line segments (a maximum of 5) can be included on the same DVD and mp4 as long as they are in the same basin.
3. Two labels are required. One label shall be placed on the spine of the DVD and the other on the face of the DVD and mp4 flash drive. Permanently label each DVD and mp4 flash drive with the following information:

Spine of DVD and sheet accompanying mp4 flash drive

Engineer File No.: _____ Contractor's Name: _____

Inspection Type: Survey Pre-Installation Post-Installation

DVD and mp4 No.: _____ Date Televised: _____ Date Submitted: _____

Face of Tape

Manhole No. From	Manhole No. To	Pipe Diameter	Pipe Length	Street
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	
_____	_____	_____	_____	

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin cleaning until both upstream and downstream manholes, inlets and junction boxes have been checked for flow monitors or other mechanical devices. Refer to Section 02764 - Manhole Rehabilitation.

3.02 PREPARATION

- A. Cleaning.
1. Take precautions to protect lines (pipes, boxes, leads/laterals), and manholes and junction boxes and inlets from damage that might be inflicted by the improper selection of the cleaning process or improper use of the equipment. When using hydraulically propelled devices, take precautions to ensure that the water pressure created does not cause damage or flooding to public or private property. Do not surcharge the lines (pipes, boxes, leads/laterals) beyond the elevation that could cause overflow of sewage or stormwater into area waterways, homes, or buildings or onto the ground.
 2. Do not use or obstruct a fire hydrant when there is a fire in the area. Remove water meters, fittings and piping from fire hydrants at the end of each working day.
 3. Exercise care to prevent contamination of the potable water system. Use of a backflow preventer of appropriate size is mandatory when drawing water from a public hydrant.
 4. Where possible, use the flow of wastewater or stormwater present in the sanitary sewer and stormwater main to provide fluid for hydraulic cleaning devices.
- B. Televising. Contractor shall use the Television Inspection Report form following this section to document results of TV inspections.

3.03 CLEANING

- A. Conserve Water. Do not waste water from the public water supply because of poor connections or from hydrants left opened.
- B. Install Collapsible Dam. Use a collapsible dam for hydraulically propelled devices which require a head of water to operate. Provide a dam which is easily collapsible to prevent damage to the lines (pipes, boxes, leads/laterals), public property, or private property.
- C. High Velocity Cleaning. Operate high-velocity cleaning equipment so that the pressurized nozzle moves continuously. Turn off or reduce the flow to the nozzle to prevent damage to the line any time the nozzle becomes stationary.
- D. Mechanical Cleaning. In addition to normal cleaning equipment, perform mechanical cleaning when required and approved using equipment and accessories defined in mechanical cleaning equipment.
- E. Debris Disposal. Remove sludge, dirt, sand, rocks, grease, roots, marine growth and other solid or semi-solid material resulting from the cleaning operation at the

downstream manhole, inlet and junction box of the section being cleaned. Passing debris from one line section to any other line section is not allowed. Load debris from the manholes, inlets and junction boxes into an enclosed container for liquid waste hauling. Remove and dispose of solids or semi-solids resulting from cleaning operations at the end of each workday. Do not accumulate debris, liquid waste, or sludge on the site except in totally enclosed containers approved by the Owner's Representative.

- F. Disposal Sites. Dispose of waste at a legally-permitted disposal site using a transporter who has a valid TCEQ Liquid Waste Transporter Permit.

3.04 TELEVISION

- A. Immediately after cleaning, televise the lines (pipes, boxes, leads/laterals) to document the condition of the line and to locate existing service connections, leads and laterals. Notify the Owner's Representative 24 hours in advance of any TV inspection so that the Owner's Representative may observe inspection operations.
- B. Perform TV inspection of storm and sanitary sewers as follows:
 - 1. Perform a survey TV inspection on any lines (pipes, boxes, leads/laterals) within the boundary of the project, as directed by the Owner's Representative. After reviewing survey TV tapes, the Owner's Representative will identify which lines (pipes, boxes, leads/laterals) will be rehabilitated or will need additional work.
 - 2. Perform pre-installation TV inspection immediately after line cleaning and before line rehabilitation work. Pre-installation TV is not required for lines (pipes, boxes, leads/laterals) designated as "remove and replace". Verify that the line is clean and ready to accept the line rehabilitation. Prepare Television Inspection Report forms. Maintain copies of tapes and reports for reference by the Owner's Representative for the duration of the project.
 - 3. Perform post-installation TV inspection to confirm completion of rehabilitation work, including removal and replacement. Verify that the rehabilitation work conforms to the requirements of the Drawings and Specifications. Provide a color DVD and mp4 showing the completed work, including the condition of restored service connections. Prepare and submit Television Inspection Report forms providing location of service connections along with location of any discrepancies. Manhole, inlet and junction box work, including benches, inverts and pipe penetrations into manhole, should be complete prior to post-installation TV work.
 - 4. Videos shall pan beginning and ending manholes, inlets and junction boxes to demonstrate that all debris has been removed. Camera operator shall slowly

pan each service connection, clamped joints, and when pipe material transitions from one material to another. A TV Inspection Report shall be completed for every segment that is submitted to the Owner’s Representative.

- C. TV inspection tapes shall be continuous for pipe segments between manholes. Do not leave gaps in the video taping of a segment between manholes and do not show a single segment on more than one DVD and mp4, unless specifically allowed by the Owner’s Representative.

3.05 FLOW CONTROL

- A. Perform survey TV inspection on one manhole section at a time. Adequately control the flow in the section being televised. Do not exceed the depth of wastewater flow shown below:

Pipe Diameter inches/Box cross sectional area sq. ft. (Inches)	Depth of Flow (Percent of Pipe Diameter/box height)
6 to 10/0.5 to 1	10
12 to 24/1 to 4	15
Over 24/over 4	20

- 1. If during survey TV inspection of a manhole section, the wastewater or stormwater flow depth exceeds the maximum allowable, reduce the flow depth to an acceptable level by performing the survey TV inspection during minimum flow hours, by diversion pumping, or by pulling a camera with swab, high-velocity jet nozzle or other acceptable dewatering device. DVD made while floating the camera is not acceptable unless approved by the Owner’s Representative.

- B. Minimize flow in the line while performing pre-installation TV inspection. Divert the normal flow and clean the line to be inspected.
- C. No flow is allowed in the line while performing post-installation TV inspection.

3.06 PASSAGE OF TV CAMERA

- A. Do not pull or propel the television camera through the line at a speed greater than 30 feet per minute.

- B. If during survey TV inspection of a manhole, junction box and inlet section, the camera is unable to pass an obstruction even though flow is unobstructed, televise the manhole, junction box and inlet section from the other direction (reverse setup) in order to obtain a complete video of the line. Whenever such a condition arises, notify the Owner's Representative to determine if an obstruction removal or point repair is necessary. If a point repair is authorized, repair the pipe and box at the designated location and then re-televise the manhole, inlet and junction box section to verify completion of the point repair, unless waived by the Owner's Representative.
1. When the camera is being pulled from the other direction in order to survey on either side of an obstruction and a second repair location is encountered away from the first obstruction, notify the Owner's Representative and request a review of the TV tape. The Owner's Representative may direct the Contractor to make one or both point repairs. No downtime shall be allowed.
 2. If two point repairs are allowed and completed, re-televise the manhole section. Generally, up to 20 feet of the lines (pipes, boxes, leads/laterals) from the finished end of the first point repair to the starting end of the second point repair may be lamped or physically inspected to verify the condition of the sewer without further TV inspection.
 3. The Owner makes no guarantee that the lines (pipes, boxes, leads/laterals) specified or proposed for survey TV after cleaning, is clear for the passage of the camera set-up. Select the appropriate equipment, tools, and methods for securing safe passage of the camera.
- C. During pre-installation TV inspection, camera passage should show the line is ready to rehabilitate. Report any variations between previous reported (existing data) conditions and the actual conditions encountered to the Owner's Representative.
- D. For post-installation TV inspection, exercise the full capabilities of the camera equipment to document the completion of the rehabilitation work and the conformance of the work to the Drawings and Specifications. Provide a full 360-degree view of pipe, joints and service connections.

3.07 TV INSPECTION REPORT

- A. For each TV inspection video provide a completed TV Inspection Report, as attached at the end of this section. The Report is a written/narrated log of pipe defects, sags, service connection locations and conditions, indexed to the footage counter. The TV Inspection Report shall be filled out as instructed below.
- B. Direction of Flow

1. MANHOLE/INLET/JUNCTION BOX NUMBER: The upstream manhole number of the line segment shall be put in this field. This is an alphanumeric field with 9 spaces available (i.e. SB179003).
2. MANHOLE/INLET/JUNCTION BOX NUMBER: The downstream manhole number of the line segment shall be put in this field. This is an alphanumeric field with 9 spaces available (i.e. SB179002).

C. Header Section

1. ADDRESS UPS/DWN: The upstream and downstream address of the line segment shall be put in this field. This is an alphanumeric field with 6 spaces available for the street number and 21 spaces available for the street name (i.e., UPS: 2150 Sunnyland DWN: 2110 Sunnyland).
2. W.W. FILE NO.: The Owner's Representative's File number shall be put in this field. This number is found on the contract documents and specifications. This is an alphanumeric field with 10 spaces available (i.e., 4250-49).
3. WORK ORDER NO.: This number will be provided by the Owner, this field shall be left blank. This is a numeric field with 10 spaces available.
4. TV DATE: The date that the DVD was produced shall be placed in this field. This date shall be the same as the date shown on the display screen. This is a numeric field with 8 spaces available (i.e., 2/21/95).
5. BASIN: The basin that the line segment is located in shall be placed in this field. This is an alphanumeric field with 10 spaces available (i.e., IA010).
6. TV CONTRACTOR: The TV Contractor's name shall be placed in this field. This is an alphanumeric field with 5 spaces available.
7. WEATHER: The existing weather conditions at the time that the TV tape was made shall be placed in this field. This is an alpha-numeric field with 10 spaces available (i.e., Cloudy)
8. VTR FORMAT: The VTR format shall be placed in this field. This is an alphanumeric field with 4 spaces available (i.e., VHS).
9. TAPE NUMBER: Each TV tape produced must have a tape number for identification. This number must be affixed to the cassette label. This number must not be duplicated in the same project. This is an alphanumeric field with 6 spaces available (i.e., IA0101).

10. VTR INDEX: The numeric location of the line segment on the tape shall be indicated here. This is an alphanumeric field with 6 spaces available for each number (i.e., 1336 to 2185).
11. SUMMARY:
 - a. This line is to be used to put in additional information about the line segment as indicated below:
 - b. Type of TV Tape (i.e., Post, Survey, Pre-Rehabilitation)
 - (1). General Contractor (i.e., Cullum, Kinsel, Texas Sterling)
 - (2). Rehabilitation Method (i.e., FF, CPP, PB, SL, RR)
 - (3). Rehabilitation System Manufacturer or Trade Name when applicable (i.e., Insituform, Inliner II)
 - (4). PIM System, McConnell Pipe Crushing, U Liner)
 - (5). Pipe Trade Name for PVC, PEP or FRP pipe (i.e., Hobas, Drisco 1000, Lamson Vylon, Quail)
 - c. This information will be noted in the following manner:
 - (1). Post/Cullum/FF/U Liner/Quail (a typical listing for a **Fold and Form** line segment)
 - (2). Post/Insituform/ CPP/Insituform (a typical listing for a **Cured-in-Place** line segment)
 - (3). Post/McLat/PB/McConnell PipeCrushing/Drisco1000 (a typical listing for a **Pipeburst** line segment)
 - (4). Post/Kinsel/SL/Hobas (a typical listing for a **Sliplined** line segment)
 - (5). Post/Texas Sterling/RR/Lamson Vylon (a typical listing for a **Removed and Replaced** line segment)
12. LOCATION: The physical location of the line segment shall be placed in this field. The location is for the line segment, not the manholes. If the line segment covers more than one location, then choose location where majority of line segment is. The codes for the location are shown on the attached Television Inspection Codes list. This is an alpha-numeric field with 2 spaces available (i.e., C)

13. SURFACE COVER: The type of surface that covers the line segment shall be placed in this field. Use the designation that reflects what covers the majority of the line segment. The codes for surface cover are shown on the attached Television Inspection Codes list. This is an alpha field with only 1 space available (i.e., F).
14. PIPE SIZE: The inside diameter of the liner or pipe based on new pipe size, material and SDR shall be placed in this field. The unit of measure is inch. This is a numeric field with 6 spaces available, which includes 2 spaces for decimals (i.e., 6.58 IN).
15. PIPE TYPE: The pipe or liner type installed shall be placed in this field. This is an alpha field with 3 spaces available (i.e., PEP, CPP, PVC).
16. LENGTH: The length of the line segment shall be placed in this field. The length shown on the TV report shall be the same as the length shown on the DVD. Also, the length on the top portion of the TV report shall match that shown on the bottom portion of the TV Report. The unit of measure is feet. This is a numeric field with 4 spaces available, with no decimals (i.e., 305 FT).
17. UPS DEPTH: The depth, measured from the top ring of the upstream manhole to the invert of the upstream manhole, shall be placed in this field. The unit of measure is in feet and tenths of feet. This is a numeric field with 3 spaces available, which includes one space for a decimal (i.e., 6.9 FT).
18. DWN DEPTH: The depth, measured from the top ring of the downstream manhole to the invert of the downstream manhole, shall be placed in this field. The unit of measure is in feet and tenths of feet. This is a numeric field with 3 spaces available, which includes one space for a decimal (i.e., 7.4 FT).
19. JOINT LENGTH: The pipe joint length shall be placed in this field. Show no joint length for CPP, FF and PEP line segments. Put a "0" in the field for these line segments that have no joints. The unit of measure is inch. This is an alpha field with 2 spaces available (i.e., 40 IN).
20. FLOW DEPTH: The pipe or liner flow depth shall be placed in this field. The unit of measure is inch. This is a numeric field with 3 spaces available, which includes one decimal place (i.e., 2.5 IN).
21. MASTER DVD NO. : The Contractor's master DVD and mp4 number (if one exists) shall be placed in this space. This item is not in the database, therefore there is no field length or type data for this item.

22. REVERSE SET UP: When a reverse set up is done on a line segment check "yes" if not check "no". This item is not in the database, therefore there is no field length or type data for this item.
23. SKETCH: If a sketch of the line segment is included check "yes" if not check "no". This item is not in the database, therefore there is no field length or type data for this item.
24. PRIOR HISTORY: If any prior information exists on this line segment check "yes" if not check "no". This item is not in the database, therefore there is no field length or type data for this item.
25. EVALUATION TV: If the TV Inspection Report is for line segment evaluation or survey purposes check "yes" if not check "no". This item is not in the database, therefore there is no field length or type data for this item.
26. PRE-REHAB TV: If the TV Inspection Report is for pre-installation TV inspection to show that the line is ready for rehabilitation check "yes" if not check "no". This item is not in the database, therefore there is no field length or type data for this item.
27. POST-REHAB TV: If the TV Inspection Report is for post-rehab TV inspection to document the completion of the rehabilitation work check "yes" if not check "no". This item is not in the database, therefore there is no field length or type data for this item.
28. LINE DETERIORATION: The existence of pipe deterioration and how much deterioration exists shall be indicated here. If there is no deterioration check "N" if deterioration is light check "L", if it is medium check "M", if it is heavy check "H". This item is not in the database, therefore there is no field length or type data for this item.
29. DIRECTION OF FLOW: The direction of flow in the line segment shall be placed in this field. Typically, the larger number is the upstream manhole and the smaller number is the downstream manhole, inlet and junction box. Do not reverse the manhole, inlets and junction box designation on the TV report if a reverse set up is shown, check the reverse set up box on the report.

D. CODE INPUT SECTION

1. TV INSPECTION CODES: Codes to be used in this section are shown on the Television Inspection Codes sheet (attached).
2. FOOT READ U/D: The up/down designation shall be shown under the section titled "Footage Reading" in the boxes marked "U." and "D." This will make it clear what direction footage is measured from.

3. **CLOCK POSITION:** The clock position, with 12 o'clock straight up, of each defect shall be shown in this field (i.e., 12:00, 3:00). Also, show the clock position of each service connection and state the condition of the connection. Include the distance the connection is protruding into the pipe and box, when appropriate, and the type of connection, such as plumber service.
4. **CRACKS:** Any cracks in the pipe shall be listed in this field using the codes on the Television Inspection Codes sheet. Report the size length and width of any cracks.
5. **JOINTS:** Misaligned and broken joints shall be listed in this field using the codes on the Television Inspection Codes sheet.
6. **LATERALS:** All laterals shall be listed in this field using the codes on the Television Inspection Codes sheet.
7. **ROOTS:** Any root intrusion into the pipe and box shall be listed in this field using the codes on the Television Inspection Codes sheet.
8. **DEBRIS:** Any debris in the pipe and box shall be listed in this field using the codes on the Television Inspection Codes sheet.
9. **INFLOW/INFILTRATION:** Report any inflow and infiltration in this field using the codes listed on the Television Inspection Codes sheet.
10. **ALIGNMENT:** Report the existence of any sags in the field using the codes listed on the Television Inspection Codes sheet. Report the beginning of sags for one-quarter pipe, one-half pipe and underwater as well as where the camera pulls out of the sag.
11. **STRUCTURAL:** Report structural condition of the pipe using the codes listed on the Television Inspection Codes sheet.
12. **PICTURE NO.:** Leave this field blank.
13. **COMMENTS:** Comments shall be placed in this field. Comments must be accompanied by a corresponding footage. Items to report in this field are: collapses in pipe, stabilized material, mineral deposits, changes in pipe material, reverse set up, drop stack, large voids, multiple cracks, when unable to continue video, etc.
14. **CLAMP/SPLICE LOCATION:** The clamp/splice location shall be shown in the Comments field. Clamp/splice location must be accompanied by a footage.

15. START SURVEY AT M. H. XYZ: The depth of the line segment shall be shown in the Comments field. (i.e., Start Survey at M. H. 021 - Line Depth 10.2 FT). The depth is to be measured from the top ring of the manhole to the invert of the pipe being televised. The unit of measure is feet and tenths of feet. This depth may be different from the manhole depth.
16. END OF SURVEY AT M. H. XYZ: The depth of the line segment shall be shown in the comments field (i.e., End Survey at M. H. 022 - Line Depth 10.8 FT). The depth is to be measured from the top ring of the manhole to the invert of the pipe being televised. The unit of measure is feet and tenths of feet. This depth may be different from the manhole and junction box depth.

3.08 FIELD QUALITY CONTROL

- A. Do not allow, under any circumstances, sewage or solids removed in the cleaning process to be released onto streets or into ditches, catch basins, storm drains, sanitary or storm sewer manholes, or cleanouts.
- B. Acceptance of lines (pipes, boxes, leads/laterals) cleaning work is contingent upon the successful completion of the television inspection. If the television inspection shows debris, solids, sand, grease, or grit remaining in the line, the cleaning will be considered unsatisfactory. Repeat cleaning, inspection, and televising of the lines (pipes, boxes, leads/laterals) line until cleaning is satisfactory.

3.09 ADJUSTING

- A. Repair manholes, junction boxes and inlets which are dismantled or damaged during the cleaning process and replace any manhole frame and cover which is damaged during the cleaning process.

TABLE 02733A
TELEVISION INSPECTION CODES

HEADER INFORMATION		JOINTS		
LOCATION		MJ – MISALIGNED JOINT		BJ – BROKEN JOINT
		CODES	DESCRIPTION	USE IN
A	STREET ROW, HEAVY TRAFFIC			
B	STREET ROW, LIGHT TRAFFIC	A (3)	DRP JT > 90% CLEAR	MJ
C	EASEMENT, POOR ACCESS	B (6)	DRP JT 80 – 90% CLEAR	MJ
D	EASEMENT, GOOD ACCESS	C (9)	DRP JT < 80% CLEAR	MJ
E	PARKING LOT, POOR ACCESS	D (3)	SHF JT > 90% CLEAR	MJ
F	PARKING LOT, GOOD ACCESS	E (6)	SHF JT 80 – 90% CLEAR	MJ
G	ALLEY, POOR ACCESS	F (9)	SHF JT < 80% CLEAR	MJ
H	ALLEY, GOOD ACCESS	G (1)	WD JT 2” – 3”	MJ
I	OPEN AREA, POOR ACCESS	H (2)	WD JT 3” – 4”	MJ
J	OPEN AREA, GOOD ACCESS	I (3)	WD JT > 4”	MJ
SURFACE COVER		J (2)	BRK JT – LIGHT	BJ
A	ASPHALT STREET	K (4)	BRK JT – MEDIUM	BJ
B	CONCRETE STREET	L (6)	BRK JT – HEAVY	BJ
C	SHELL STREET	N (0)	VISIBLE GASKET	MJ
D	SIDEWALK	O (0)	LEAKING AT JOINT	MJ
E	TREES/SHRUBS		LATERALS (L)	
		CODES	DESCRIPTION	
F	CLOSE TO FENCE			
G	OPEN AREA	A (1)	PRT SER 0” – 1”	
H	MOVABLE BUILDING	B (2)	PRT SER 1” – 2”	
I	UNMOVABLE BUILDING	C (3)	PRT SER 2” – 3”	
J	OVERHEAD UTILITIES	D (4)	PRT SER 3” +	
K	WATERWAY OR RAILWAY	E (5)	DEFECTIVE – SERVICE CONN.	
L	HIGHWAY OR RUNWAY	F (6)	DEAD/UNUSED SERVICE	
M	PIPE ABOVE GROUND	G (7)	FACTORY SERVICE	
PIPE TYPE		H (0)	PLUMBER SERVICE	
ABS	ACRYLONITRILE BUTADIENE STYRENE		ROOTS (R)	
		CODES	DESCRIPTION	
BRK	BRICK			
CIP	CAST IRON PIPE	A (1)	ROOTS – LIGHT	
CMP	CORRUGATED METAL PIPE	B (2)	ROOTS – MEDIUM	
CON	POURED IN PLACE CONCRETE	C (3)	ROOTS – HEAVY	

CPP	CURED IN PLACE PIPE
DIP	DUCTILE IRON PIPE
FRP	FIRBERGLASS REINFORCED PIPE
PLP	PLASTIC LINED CONCRETE PIPE
PEP	POLYETHYLENE PIPE
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RPM	REINFORCED PLASTIC MORTAR PIPE
URC	UNREINFORCED CONCRETE PIPE
VCP	VITRIFIED CLAY PIPE

WEATHER

DRY - WET

CODE DESCRIPTIONS

CRACKS

RC-RADICAL LC-LONGITUDINAL

CODES	DESCRIPTION	USE IN
A (1)	<1/2" W, < 1' L	CRK
B (2)	<1/2" W, 1' - 2' L	CRK
C (3)	<1/2" W, > 2' L	CRK
D (4)	>1/2" W, < 1' L	CRK
E (5)	>1/2" W, 1' - 2' L	CRK
F (6)	>1/2" W, > 2' L	CRK
G (7)	HOLE IN PIPE - SMALL	
H (8)	PIPE MISSING - < 60°	
I (9)	PIPE MISSING - > 60°	

DEBRIS (D)

CODES DESCRIPTION

A	DEBRIS - LIGHT
B	DEBRIS - MEDIUM
C	DRBRIS - HEAVY
D	GREASE - LIGHT
E	GREASE - MEDIUM
F	GREASE - HEAVY

INFLOW/INFILTRATION (I)

CODES DESCRIPTION

A (3)	I/I - LIGHT (0-1 GPM)
B (6)	I/I - MEDIUM (1-5 GPM)
C (9)	I/I - HEAVY (>5 GPM)
D (2)	I/I - SOME EVIDENCE
E (4)	I/I - CONSIDERABLE EVIDENCE
F (6)	I/I - GREAT EVIDENCE
G (0)	I/I - NO EVIDENCE

ALIGNMENT (A)

CODES DESCRIPTION

A	BEGIN 1/4 PIPE WATER
B	BEGIN 1/2 PIPE WATER
C	CAMERA UNDERWATER
D	END CAMERA UNDERWATER
E	END 1/2 PIPE WATER
F	END 1/4 PIPE WATER

STRUCTURAL

DS - DETERIORATED; OS - OVALITY; CS - COLLAPSED

CODES	DESCRIPTION	USE IN
A (3)	LINE DET - LIGHT	DS
B (6)	LINE DET - MEDIUM	DS
C (9)	LINE DET - HEAVY	DS
D (3)	OVAL < 5%	OS
E (6)	OVAL > 5% & < 10%	OS
F (9)	OVAL > 10%	OS
G (9)	COLLAPSED	CS
H (0)	PIPE DET - HEAVY	DS

L (0)	PIPE DET – LIGHT	DS
M (0)	PIPE DET – MEDIUM	DS
N (0)	PIPE DET – NONE	DS
O	LINE DET – NONE	DS
Z (0)	AT MANHOLE NUMBER	CS

NOTE:
REPLACE PIPE
WITH BOX AS
NEEDED

END OF SECTION