

**CITY OF MANSFIELD
REQUEST FOR PROPOSAL (RFP)
SEWER INSPECTION & TEST SERVICES
Response Due Date: November 10, 2022**

The City of Mansfield, Ohio, will received sealed proposals from qualified Sewer Inspection Service consultants to provide sanitary and storm sewer (main and lateral lines) Close Circuit Television (CCTV) inspection and smoke testing services. Submit proposals to the following address:

Attn: Alex Pitts
City of Mansfield
Engineering Dept.
30 N Diamond St
Mansfield, OH 44902

The City of Mansfield will not accept proposals submitted after 4:00 p.m. on November 10, 2022.

The consultant will provide sewer inspection and test services for the City's sanitary and storm sewer systems for a period of three (3) years with the option of two (2) 1-year extensions.

Scope of Services

The Consultant shall perform sewer CCTV inspection and smoke testing services in designated areas within the existing city limits as directed by the City Engineer or designee.

Notice given this 26th day of October, 2022.

By order of the City of Mansfield,

DAVID L. REMY
PUBLIC WORKS DIRECTOR
CITY OF MANSFIELD
BY ORDINANCE #22-216

INSTRUCTIONS TO PROPOSERS

Communication & Questions Regarding this RFP

All communications related to this RFP shall be directed to Alex Pitts, at (419) 755-9702 or apitts@ci.mansfield.oh.us. Questions regarding the RFP must be submitted in writing (via email to Alex Pitts) at least one week prior to the proposal response due date listed above. If the City deems it necessary to answer any questions submitted, copies of all questions and responses will be sent by email to all Proposers as an addendum to the RFP. The identity of Proposer submitting the questions will not be disclosed in the Addendum. Questions of minor significance may be discussed verbally; however, only written responses may be considered to be a part of the RFP.

Submittal

All proposals submitted shall be binding upon the Proposer, however the City shall not be obligated to award any contract(s) as a result of this process. All proposals must be in writing, and the envelope containing the Proposal shall be sealed and addressed to the City and delivered or mailed to the address above. The envelope shall be plainly marked in the upper left-hand corner as follows:

ATTENTION: CITY ENGINEER

(Proposer's Name and Address)

REQUEST FOR PROPOSAL - SEWER INSPECTION & TEST SERVICES

Any proposal received after the time stated above for any reason whatsoever will be rejected. In addition, unauthorized conditions, limitations, or provisions attached to the Proposal may render it unresponsive and may cause its rejection. However, the City reserves the right to reject any or all proposals and to waive any informality or irregularity in any proposal received and to be the sole judge of the merits of the proposals received.

All Proposals shall include the following executed documents:

- **Designation of Subcontractors (if any)**
- **Three (3) references with contact information for the main agency manager.**
- **Declaration of Proposer's Qualifications**

PROPOSAL EVALUATION

The award of any contract shall be at the sole discretion of the City. It is the intent to make an award to one Consultant although the City reserves the right to make multiple awards depending on the best interest of the City. The contents of the Proposal of the selected Consultant will become the basis for a contractual obligation when the award of contract is made, although the City reserves the right to engage in negotiations over pricing, service and/or staffing with one or more Consultants.

Evaluation Criteria - The following criteria will be used to evaluate and rank the Proposals:

- 1) Consultant's qualifications, experience, past performance and track record;
- 2) The experience and past performance of the employees, agents, and subcontractors specifically assigned to this project;
- 3) Experience and familiarity with the City's infrastructure;
- 4) Satisfactory reference checks.

Consultants among the highest ranked may be invited to participate in interviews. The City envisions awarding the contract to the top ranked Consultant, if final negotiations are successful and conclude with a mutually acceptable agreement. If an agreement cannot be reached, the City may negotiate with the next best Consultants.

Any Proposal that contains items that are incorrect, has incomplete portions of items scheduled, or does not respond to items in the manner specified in this RFP may be considered non-responsive and may be rejected on these basis at the sole discretion of the City. The City reserves the right to waive any defects in the Proposal.

Contract

A Proposer whose proposal is accepted shall properly sign a written Contract with the City within ten (10) calendar days from the date of the Notice of Award.

**REQUEST FOR PROPOSAL (RFP)
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PROPOSER'S INFORMATION

Proposer certifies that the following information is true and correct:

Company Name: _____

Business Address: _____

Telephone: _____

Proposer Name/Title: _____

Authorized Signature: _____

Phone: Fax: _____

Email: _____

This page must be submitted with the proposal.

**REQUEST FOR PROPOSAL (RFP)
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DESIGNATION OF SUBCONTRACTORS

Using the form below, Consultant shall set forth the name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime Consultant under the contract. The Consultant shall further set forth the portion of the work that will be done by each subcontractor. Failure to provide such information may render the proposal unresponsive.

If the Consultant fails to specify a subcontractor for any portion of the work to be performed under the Contract, the Consultant shall be deemed to have agreed to perform such portion of work under its own workforce, and shall not be permitted to subcontract that portion of the work except under the conditions hereinafter set forth.

Type of Work	% of Total Contract	Subcontractor's Name

This page must be submitted with the proposal.

**REQUEST FOR PROPOSAL (RFP)
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REFERENCES

Using the form below, list three (3) Public Works or similar service contracts completed within the last 24 months or now in progress. Also provide the number of years of experience the proposer has as a consultant in service of contracts of this type.

Project	Contract Amount	Type of Contract	Date Completed	Name, Address, Phone Number of City
1				
2				
3				
Number of years as a consultant in service contracts of this type:				

This page must be submitted with the proposal.

**REQUEST FOR PROPOSAL (RFP)
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DECLARATION OF PROPOSER'S QUALIFICATIONS

Using the form below, provide clear and comprehensive answers to the questions posed. If necessary, add separate attached sheets. The Proposer may submit any additional information as desired.

Consultant Name: _____

Business Address: _____

Telephone: _____

1) How many years has this firm been engaged in the business of sewer CCTV inspection and smoke testing?

2) List all current sewer CCTV and smoke testing contracts, giving the amount of each contract, duration of the contract, and for whom the work is being performed.

3) Have you failed to complete or been terminated from any contract awarded to your Company?

If yes, please explain the reason for the failure to complete the contract. Include the name and address of the owner.

4) List experience in performing work similar to the work required hereunder.

This page must be submitted with the proposal.

5) List the background and experience of the officers and principal members including the proposed project manager for your organization.

6) List below all officers, partners, and/or stockholders who own ten (10%) or more of your company.

7) List other general services your firm provides in addition to sewer inspection and test.

This page must be submitted with the proposal.

**APPENDIX A
SCOPE OF SERVICES**

Summary: The Consultant shall perform CCTV inspection and smoke testing in the areas within city limits as directed by the City Engineer or designee. Regular reporting of the completed work shall be provided to the City.

The Consultant shall perform the services as described in detail in this section:

A) GENERAL

COORDINATION

Consultant shall accommodate City representative who will be monitoring Consultant's activities.

WORK HOURS

Standard work hours shall occur between the hours of 7:30 AM to 4:00 PM, Monday through Friday.

HEALTH AND SAFETY

A. All work shall be done in a safe, competent manner. Work performed, methods, and equipment used shall be in conformance with the prevailing State and Federal Occupational Safety and Health Act. Costs from delays and losses due to Consultant operations not in conformance to these acts, or stoppages by OSHA inspectors or designated representatives, as a result of non-conformance, shall be solely borne by the Consultant.

B. All manholes shall be treated as confined spaces if entry is necessary. All OSHA requirements shall be followed.

PREVENTION OF PROPERTY DAMAGE

During inspection and test operations, precautions shall be taken to prevent damage to the existing pipe and manholes. Care must also be taken to prevent damage to private property. Consultant is responsible for all costs related to damage to private properties that occur during these operations. Consultant is responsible for charges related to containment and cleanup associated with sewage discharges occurring due to Consultant operations.

USE OF SUBCONTRACTORS

Consultant shall perform all inspection and test work with their own forces. Use of a subcontractor is not allowed for inspection and test operations. Consultant may use subcontractors for traffic control.

B} CCTV INSPECTION

CCTV inspection shall be per the guidelines herein (see Appendix B). Primarily, CCTV inspection services shall be provided for the following efforts with regard to sanitary and storm sewers:

- Assess internal structural and service conditions of sewer mains and laterals (from structure foundations to main connection),
- Identify and locate miscellaneous construction features or blockages,

- Assist in investigative work, such as: locating manholes and laterals, locating areas where cleaning activities are required, aiding in rehabilitation (lining) projects, and aiding with point repairs.
- Other similar purposes as required by the City Engineer or designee.

C) SMOKE TESTING

Smoke testing shall be per the guidelines herein (see Appendix C). Primarily, smoke testing services shall be provided to aid the City in identifying areas of inflow and infiltration into the sanitary sewer system.

**APPENDIX B
GUIDELINES FOR CCTV INSPECTION**

1. GENERAL DESCRIPTION

CCTV inspection services shall be provided for sanitary and storm sewer systems. Regular reporting of the completed work shall be provided to the City.

2. GENERAL PROVISIONS BY THE CONTRACTOR

2.1 The Consultant shall provide all required traffic control, including warning lights and traffic cones, as needed.

2.2 If required, the Consultant shall obtain all permits required by the local jurisdiction.

3. SEWER INSPECTION:

OPERATORS

3.1 The CCTV inspection work must be completed by certified National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) trained operator(s) using established PACP coding and observations.

EQUIPMENT

3.2 The Consultant's CCTV equipment shall include video cameras, a video monitor cable, power sources, and all equipment necessary to perform a CCTV inspection as outlined herein.

3.3 The cameras shall meet OSHA requirements for operating in the sanitary sewer environment.

3.4 The cameras shall have Pan-and-Tilt capabilities, with a minimum pan of 270° and rotation of 360°. Illumination sensitivity shall be three lux or less and provide a minimum of 470 lines of resolution. The focal distance shall be adjustable through a range from 25 mm (1 inch) to infinity. Service laterals shall be inspected utilizing a self-leveling push camera system. The cameras shall be capable of operating in 100% relative humidity conditions.

3.5 During CCTV inspection, lighting intensity shall be adjusted to minimize glare. Lighting and picture quality shall be adjusted to provide a clear, in-focus picture of the entire periphery of the pipeline for all conditions encountered. Lightning capability of the camera system shall be suitable to permit a clear picture of the entire inner pipe wall extending at least 10 feet in front, including black High-Density Polyethylene (HDPE) pipe.

- 3.6 All camera systems shall be able to navigate around minor objects, roots, and debris. The system used to move the camera through the pipe shall not obstruct the camera's view or interfere with proper documentation of the sewer conditions.
- 3.7 The camera cable shall be retracted to remove slack and to ensure an accurate footage reading.
- 3.8 The distance shall be measured from center of start manhole. It shall be recorded in standard units and the video display readout shall display units to one-tenth of a foot.
- 3.9 The cable footage-counter shall be accurate to plus or minus 2 feet per 1,000 feet.
- 3.10 Video inspection and reporting shall be submitted in a NASSCO-compatible format.
- 3.11 The camera lens shall be kept clear of condensation and debris during the CCTV inspection.
- 3.12 The inspection equipment shall include a lateral launch camera.
- 3.13 The inspection equipment shall include a sonde device and real-time GPS locating equipment for accurate locating of features and defects.

OBSERVATIONS

- 3.14 All observations and defects shall be documented in a database and shall include digital video recording and digital photographs as defined below.
- 3.15 Each video clip and photograph provided shall correspond to inspection data in the database.
- 3.16 All observations shall be selected from a standard table of descriptions incorporated in the inspection reporting software, as required by PACP. Any additional comments regarding the observation shall be indicated in the remarks box.
- 3.17 The severity of each defect or observation shall be recorded and rated according to the PACP method.
- 3.18 All observations shall be recorded using PACP codes as outlined in NASSCO's PACP Reference Manual, and in this document.

VIDEO

- 3.19 The Consultant shall make a continuous color digital recording in MPEG 4 format for each pipe segment inspected, unless specified by City.
- 3.20 Video files shall have a minimum resolution of 352 x 240 pixels and an interlaced frame rate at a minimum of 24 frames per second.

- 3.21 Audio reporting will be avoided to prevent inconsistent operator subjectivity.
- 3.22 Video inspection will not exceed a traverse rate of 30 feet per minute.
- 3.23 The Consultant shall pause the digital recording at any time there is a delay in the inspection and restart the digital video recording in the same digital file. The pause shall in no way affect, freeze, or interrupt the replay of the video and shall not close the video file during the inspection.
- 3.24 Each pipe segment (manhole-to-manhole) shall be identified with an initial text screen and completed in accordance with PACP's CCTV inspection form header Instructions and shall be as follows:

Line Number & Description

- Line 1: Surveyed By
- Line 2: City*
- Line 3: Street
- Line 4: Location Code*
- Line 5: Weather*
- Line 6: Direction of Survey
- Line 7: Use of Sewer
- Line 8: Pipe Material
- Line 9: Pipe Diameter/Height
- Line 10: Start Manhole Number
- Line 11: End Manhole Number
- Line 12: Pipe ID (PSR or MMS #)
- Line 13: Inspection Time/Date/Feet TV'd

Line items noted with an asterisk (*) are optional depending on the line capacity of the text overlay equipment.

- 3.25 This data must completely match the data entered in the database header information.
- 3.26 The initial text screen shall appear no more than 15 seconds at the beginning of the video footage, be of legible color, and shall appear before the 360° pan of the starting manhole.
- 3.27 During the CCTV inspection, at all times the video shall show current measured footage.
- 3.28 During the CCTV inspection, the camera shall stop at all defects and significant observations to ensure a clear and focused view of the pipe condition and shall rotate the camera head at the defect to allow for adequate evaluation at a later time.
- 3.29 All defects and significant observations shall include a text overlay of the recorded observation.

3.30 The video recording shall include on-screen observation text for every observation recorded in the database, including AMH, in addition to the text in Paragraph 3.25.

3.31 The naming of the video file shall consist of the "FROM MANHOLE ID NUMBER", "TO MANHOLE ID NUMBER", and eight-digit inspection date, as shown in the following example, or as pre-approved by City:

MH ID_MH ID_20050101.mp4
(From MH ID_To MH ID_YYYYMMDD)

PHOTOGRAPHS

3.32 Digital photographs in JPEG format shall be made of all recorded defect observations. These photographs will be computer generated with the use of the inspection reporting system software.

3.33 JPEG images shall be captured at a minimum resolution of 640x480 pixels.

3.34 At a minimum, all photographs shall be named consisting of the following descriptions: "FROM MANHOLE ID NUMBER", "TO MANHOLE ID NUMBER", eight-digit inspection date, and the defect 'station' location along the pipe. It is in the Consultant's discretion as to additional data information that may be needed in the naming of the files to make each file unique within the file naming constraints of their inspection software.

MH ID_MH ID_20050101_125_A.jpg
(From MH ID_To MH ID_YYYYMMDD_Defect Position_Unique_Data)

3.35 Any additional information shall be included after the mandatory info specified above. The naming convention shall be consistent throughout the project.

LOCATING REQUIREMENTS

3.36 Using NAD83 referencing, all features (manholes, defects, etc.) shall be located via use of real-time GPS locating equipment with accuracy of a decimeter or better.

3.37 GPS locating data shall be exported to files compatible with GIS mapping applications.

ADDITIONAL INSPECTION PROCEDURES

3.38 A full 360° pan of all manholes is required. This video footage shall occur at the beginning of each pipe segment survey inspection from the bottom of the manhole panning up the manhole shaft. The Consultant shall cover the manhole opening to prevent too much light from entering the structure and to ensure a clear and focused view of the manhole interior. In instances when the manhole is the terminating manhole, then the pan shall occur at the end of the pipe segment survey inspection.

3.39 Video footage shall be taken centered on the pipe with the water level running horizontally. The camera shall run along the invert of the pipe and not at its side unless it is passing a point obstacle. If extended driving on the side of the pipe is required, then the pipe needs a thorough cleaning and an observation should be noted from the PACP codes describing the nature of the obstacle.

3.40 Obstructions may be encountered during the course of the CCTV inspection that prevents the travel of the camera. In instances when obstructions are not passable, the Consultant shall withdraw the equipment and begin a CCTV inspection from the opposite end of the sewer reach.

3.41 If a particular line is inspected more than once, then the Consultant shall include all versions of the inspections in the database. The MGO observation shall be used on all inspections except at the first occurrence. The Consultant shall provide an explanation for the additional inspections in the Remarks section.

SPECIAL CONDITIONS - EXCESSIVE DEPTH OF FLOW

3.42 Maximum depth of flow for CCTV inspections shall be 25 percent of the pipe diameter. If the depth of flow is greater, then, if possible, the CCTV inspection should be performed during the low flow periods between the hours of 10:00 PM to 6:00 AM.

3.43 The Consultant shall pay special attention to all local jurisdiction rules and regulations, especially regarding activities during off-peak hours.

3.44 If the flow is still above 25 percent on the return trip, then the Consultant can use a flow-controlling mechanism (i.e. flow reducer) to control the flow and proceed with the inspection. After the initial screen and AMH observation, the MGO observation shall be used to note the reason for the return to this location and indicate the use of such flow-controlling equipment in the appropriate box in the section header information screen.

3.45 The Consultant shall include the original inspection in the final submittal even with high flow conditions.

3.46 If the Consultant encounters a surcharging manhole (whereas the flow at the manhole is at least 50% of the sewer pipe diameter), then the Consultant shall immediately notify the City Engineer or designee.

4. DELIVERABLES AND REVIEW

DELIVERABLES

4.1 The deliverables shall consist of an external hard drive containing the database, GIS data, PDF summary, video footage, and photo files. The submittal shall include the power cord and USB connection cable for the external hard drive.

4.1.1 Summary aerial photo(s), in PDF format, with inspected mains, laterals, manholes, and anomaly observations accurately overlaid onto the aerial photo(s).

4.1.2 Summary table of all pipeline segments inspected with the following fields in the order listed:

Column 1: Date of Inspection

Column 2: Start Manhole

Column 3: Stop Manhole

Column 4: Total Pipe Length (per as-built plan)

Column 5: Televised Length

Column 6: Quick Maintenance Rating (per PACP)

Column 7: Quick Structure Rating (per PACP)

Column 8: Section Number

(*NOTE: The table shall be sorted by Start Manhole)

4.1.3 An observation table of all pipeline segments inspected with the following fields in the order listed:

Column 1: Section Number

Column 2: Position of Defect

Column 3: Observation Code (per PACP)

Column 4: Observation Description (per PACP)

Column 5: Structural Grade (per PACP)

Column 6: O&M Grade (per PACP)

(*NOTE: The table shall be sorted by Section Number)

4.1.4 GIS data files for features inspected in the field.

4.1.5 Summary aerial photo(s), in PDF format, with inspected mains, laterals, manholes, and anomaly observations accurately overlaid onto the aerial photo(s).

4.1.6 All video footage and photo files of defects or other items of interest.

4.2 External hard drive(s) shall include the following information on computer-generated labels:

4.2.1 "City of Mansfield Sewer CCTV Inspection Report"

4.2.2 General Consultant Name and Subcontractor Name

4.2.3 Project Name

4.2.4 Start Date of CCTV Inspections (e.g. MM/DD/YYYY)

4.2.5 Finish Date of CCTV Inspections (e.g. MM/DD/YYYY)

4.3 All files included as part of the deliverables shall be contained within one single folder on the hard drive and labeled with the project name (or number) and date as:

Project Name or Number_YYYYMMDD_Submittal#
(Ex. 2017_Sanitary_Sewer_Rehab_20170130_1)

REVIEW

4.4 The video recordings, photographs, and data shall be reviewed by the City for focus, lighting, clarity of view, and technical quality.

4.5 Videos or photographs recorded while a camera has flipped over in the process of traveling or the viewing of laterals, obstructions, or defects blocked by cables, skids or other equipment will not be accepted.

4.6 Shape, focus, proper lighting, and clear, distortion-free viewing during the camera operations shall be maintained. Failure to maintain these conditions will result in the rejection of the video and/or photographs by the City.

4.7 Videos or photographs recorded showing steam, inadequate lighting, or other poor image quality will be cause for rejection by City.

4.8 Any reach of sewer where recording quality, inspection, and/or report that is not acceptable to the City shall be re-televised or resolved in another mutually agreeable fashion.

5. ADDITIONAL RESPONSIBILITIES OF THE CONTRACTOR

5.1 In the event of any Consultant-related overflow or interruption/backup of customer service, the Consultant shall immediately notify the City Engineer or designee, and shall contain and eliminate the overflow.

5.2 The Consultant shall be responsible for any fines levied by others, reimbursement of any agency incurred costs, damage, cleanup, restoration of flow, and any disruption of service costs to customers as a result of the Consultant's work. This is in addition to any and all costs incurred by the City.

5.3 The Consultant shall respect the rights of property owners, and not enter upon private property without obtaining permission from the owner of the property.

5.4 For manholes located in easements of private property, unless the resident provides immediate permission, the Consultant shall provide the resident with 24-hour advanced notice for easement access prior to entering the property.

TYPICAL INSPECTION PROCEDURE

1. Display Overlay with Segment details
2. Pan Manhole 360°, from bottom looking up
3. Start inspection from edge of pipe, resetting the footage to zero at the start of pipe inspection.
4. Indicate AMH (Manhole) and MH Number in Remarks to start survey
5. Indicate MWL (Water Level)
6. Indicate MWM (Water Mark) if visible
7. Conduct survey
 - a. Record all defects & taps
 - b. Take photo of each defect
8. End Inspection
 - a. If the camera cannot pass or continue due to:
 - i. Water level > 25%
 1. Attempt during low flow period
 2. If flow is high use a flow reducer and inspect
 - ii. Roots/Collapse/Blockage
 1. Abandon Survey
 - a. Use MSA Code to indicate Survey Abandoned; indicate in the remarks why survey is abandoned.
 - b. Setup camera at next manhole, and repeat Inspection. Proceed toward the original start manhole until:
 - i. Camera cannot pass. End inspection with MSA code.
 - ii. If camera is able to make it through, end with AMH code and include an MGO code to indicate that on the reverse attempt a full inspection was completed.
 - b. If the camera reaches the end Manhole:
 - i. Indicate AMH and MH number in Remarks.
 - ii. Display Ending Screen Text.
 - iii. 360° Pan of Manhole, if the manhole is the terminal manhole.

Emergency Information:

In the event of any Consultant-related overflow or interruption/backup of customer service, the Consultant shall immediately notify the City Engineer or designee, and shall contain and eliminate the overflow.

CONVENTIONS AND DEFINITIONS

Database File Name:

Project Name or Number_YYYYMMDD_Submittal#.xlsx
(Ex. 2017_Sanitary_Sewer_Rehab_20170130_1.xlsx)

Photo Name(s):

From MH ID_To MH ID_YYYYMMDD_Defect_Position_UniqueData.jpg
(Ex. MH259_MH258_20050101_125_A.jpg)

Video Name(s):

From MH ID_To MH ID_YYYYMMDD.mp4
(Ex. MH259_MH258_20050101.mp4)

Feet Televised: This distance shall be measured from center of the start manhole.

Example Label:

City of Mansfield Sewer CCTV Inspection Report
General Consultant and CCTV Co
2017 Sanitary Sewer Rehab
Start: 07/05/2017
Finish: 07/07/2017

Screen Overlays:

INITIAL TEXT SCREEN:

Include all of the following lines of text in the order listed; if your software/hardware does not allow for 13 lines of text, the lines marked OPTIONAL can be omitted as needed.

Line 1: Surveyed By
Line 2: City (OPTIONAL)
Line 3: Street
Line 4: Location Code (OPTIONAL)
Line 5: Weather (OPTIONAL)
Line 6: Direction of Survey
Line 7: Use of Sewer
Line 8: Pipe Material
Line 9: Pipe Diameter/Height
Line 10: Start Manhole Number
Line 11: End Manhole Number
Line 12: Pipe ID (PSR or MMS #)
Line 13: Inspection Time/Date/Feet TV'd

RUNNING SCREEN TEXT:

During the CCTV inspection, at all times the video shall show current measured footage.

OBSERVATION SCREEN TEXT:

The video shall the display the following screen when an observation is recorded.

Line 1: Date/Time/City

Line 2: Start Manhole Number/End Manhole Number

Line 3: Direction of Survey

Line 4: Street Name

Line 5: Observation Code - Observation Text Description

Line 6: Pipe Diameter/Pipe Material/Current Footage

PACP Codes:

AMH – All inspections shall start with AMH, or other appropriate code for access point. (Refer to PACP Reference manual pg. 7-13)

MSA – All inspections where a segment is abandoned due to a blockage, obstruction, or collapsed sewer shall end with this code, and a reverse inspection shall be attempted. (Refer to PACP Reference manual pg. 1-4, 8-2, and 8-7)

MGO - This code shall be used when additional remarks are necessary...such as, reverse inspection, re-inspected during low flow, segment excused by DPW. Also, any defects in Manholes, such as a hole in the trough shall be recorded as an MGO.

MWL - This code shall be used at the beginning of each survey to indicate the water level, and shall be used throughout the survey if the water level changes by 5% or more. (Refer to PACP Reference manual pg. 8-2)

MWM - This code shall be used when there is an obvious mark on the side of the sewer line, where the water regularly reaches. (Refer to PACP Reference manual pg. 8-2)

RBL - This code shall be used when roots have formed a mass and, in doing so, are restricting the flow. This code should be used when the cross sectional area lost is greater than 50% **INSIDE** the service pipe connection **ONLY** (i.e. lateral or tap connections) (Refer to PACP Reference manual pg. 6-7)

RBC - This code shall be used when roots have formed a mass and, in doing so, are restricting the flow. This code should be used when the cross sectional area lost is greater than 50% and the roots extend **OUTSIDE** the service pipe connection and into the main sewer pipe. (Refer to PACP Reference manual pg. 6-7)

RBB - This code shall be used when roots have formed a mass and, in doing so, are restricting the flow. This code should be used when the cross sectional area lost is greater than 50% and the roots are **ENTIRELY WITHIN** the main sewer pipe. (Refer to PACP Reference manual pg. 6-7)

APPENDIX C
GUIDELINES FOR SMOKE TESTING

1. BACKGROUND

1.1 The City of Mansfield needs to determine where there is inflow and infiltration to the sanitary sewer to help reduce flows received at lift stations and treated in the Waste Water Treatment Plant.

2. GENERAL REQUIREMENTS

2.1 The Work shall include all mobilization/de-mobilization, labor, equipment, materials, traffic control, handing out notices, and supervision necessary for executing the smoke testing.

3. HOURS OF WORK

3.1 All work is to be done between 7:30 AM and 4:00 PM, Monday through Friday, unless otherwise approved by the City Engineer or designee.

4. APPROVED METHODS

4.1 The Consultant shall provide a portable blower designed and built specifically for the use of smoke testing. The blower shall be self-contained and powered by a minimum three (3) horsepower (HP) gasoline engine and be capable of producing a minimum of 2,000 cubic feet of air per minute when working as a blow-in ventilator and 4,000 cfm when working as a suction ventilator. The base of the blower shall have appropriate adapters and seals to make a good connection to the manhole without excessive loss of air and smoke.

4.2 Smoke production shall be achieved by use of smoke fluid or smoke bombs. Smoke fluid shall produce smoke when exposed to the heat of the exhaust system of the motor for the blower. The smoke generated, whether by use of smoke fluid or smoke bombs, shall be white to gray smoke, leaving no residue, and shall be non-toxic and non-explosive.

4.3 The Consultant shall submit an MSDS Sheet for the smoke produced.

4.4 The City Engineer or designee must approve all equipment prior to work.

5. NOTIFICATION

5.1 The City will designate areas to be smoke tested. The Consultant shall provide a breakdown for the areas that will be smoke tested each day. The list is to be submitted to the City Engineer or designee at least one week prior to scheduled work. If the Consultant needs to deviate from the submitted list, a revised list must be submitted at least two working days prior to initiation of work. Any deviations must be approved by the City.

5.2 The City will provide test notification to emergency services and the public a minimum of two working days prior to test activity.

5.3 Calls received by City staff from residents affected by smoke may be forwarded to the Consultant for response. The Consultant is to act in a polite and respectful manner when dealing with the public.

6. SMOKE TEST PROCEDURE

6.1 Unless otherwise approved by the City, the sections of sewer subject to testing shall:

(a) Consist of a central manhole, where the blower will be positioned, and an upstream and downstream manhole and the sewer pipe between them. With three (3) manholes and two pipe sections, lengths should not exceed 800 feet.

(b) Consist of two (2) manholes and one pipe section. This allows a run of up to 800 feet of pipe.

6.2 Smoke testing shall be accomplished without the need for bypass pumping. The Consultant shall provide temporary plugs, sandbags, or flow barriers as required to contain an adequate volume of smoke within the section of sewer being tested, or to limit the extent of sewer subjected to pressurized smoke. The Consultant shall monitor the resulting surcharged sewer at the manhole upstream of the section of sewer being tested, and prevent overflow conditions from occurring by removing the flow barriers. The Consultant will be solely responsible for his operations and for preventing sewer backups into the area homes and causing sewage overflows.

6.3 Prior to placing any smoke into a manhole, the Consultant shall first evacuate the system with a blower to ensure that any collection of explosive gas and any odor that may be introduced into the homes and businesses have been dispersed prior to pressurizing the sewer with smoke. Evacuation may be accomplished by removing the manhole covers of all manholes in the run, then placing a vacuum on the manhole where the blower is located, or, then blowing air into the manhole.

6.4 Smoke testing shall not be allowed on rainy days, on cloudy days following rain, or when saturated soil conditions exist. Testing shall be closely monitored on windy days. If smoke coming out of the ground is blown away so quickly as to escape accurate detection and/or photo documentation, testing shall cease until such time that conditions permit.

6.5 The perimeter of each residence or commercial building shall be completely inspected, front and back, for sources of smoke. The roofs of each building shall be visually inspected for evidence of roof drains connected to sanitary drains.

7. REPORTS

7.1 The Consultant shall periodically report smoke testing results in bound, appropriately labeled, white, three-ring binders. Digital copies shall also be submitted.

7.2 Reports to indicate:

- Dates of test
- Sections of pipe tested
- Results of tests
 - a. Defects found
 - i. PDF document including GPS map showing location of defect, pipe section tested when defect was identified, and other pertinent locating features
 - ii. Photo of each defect
 - iii. Pertinent comments
 - b. No defects found - Note section of pipe tested

7.3 Excel file summaries of defects shall be provided electronically and include:

- Unambiguous defect ID number
- Defect type
- Whether the defect location is on public or private land
- Location address
- Comments describing defect
- Judgement on defect location within 100-year flood plane or adjacent to a stream (Responses are: yes, probable, or no)
- Judgement on defect priority level (low, medium, high, or very high)

8. SAFETY EQUIPMENT

8.1 The Consultant shall be fully equipped for traffic control and manhole (confined space) entry.

8.2 The Consultant will keep on-site, during the duration of the work, all documentation relating to:

- Confined Space Entry, including entry and emergency procedures,
- Written confirmation of confined space training received by employees,
- Documentation verifying that equipment being used meets applicable requirements.