

PIPE CONDITION ASSESSMENT USING CCTV

PERFORMANCE SPECIFICATION GUIDELINE

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Disclaimer

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INTRODUCTION

These specifications were written to provide a comprehensive, uniform and consistent template for the procurement of sewer line inspection services based on the current industry services and technologies. They have been created and reviewed by industry experts including Contractors, Equipment Manufacturers and their Representatives, Municipalities, Engineers, Operators, and Field Technicians. It is hoped that facility Owners will find this useful in their procurement processes and that other parties involved in this industry find it helpful in clarifying what might otherwise be ambiguous.

This document was developed to provide clarity on the issues that have proven problematic for the procurement of pipeline inspection services. Encompassing all industry perspectives, this document strives to offer an understanding and knowledge base from which all parties can communicate in a clear and concise manner.

This document was created to allow flexibility for the end-user, whether the Owner, engineer and or municipality. As a guideline, this document is not meant to be simply cut and pasted into a specification. Flexibility rests in the ability to customize the specification to your specific budget and service requirements. The specification requires the facility Owner to make decisions while creating the document. This level of customization is necessary because specific services or technologies may not be applicable to all geographic locations or each specific project. Decisions must be made to alter and affect the outcome of the project to best suit the budget and service requirements.

Should you find this document lacking in any way, we would welcome your comments and suggestions for improvement in future revisions.

SUGGESTED PROJECT STEPS

The following is basic, step by step guidance for the successful planning, implementation and completion of a sewer inspection project. These steps have been compiled, reviewed and presented by the NASSCO Industry Standards Committee, which is comprised of experts in the field including Contractors and Sub-Contractors, Owners (public and private), Equipment Manufacturers, Operators and Engineers. The following is based upon their experiences on these projects.

1. Establish need based upon existing sewer O&M Program(s)
2. Determine Scope of Work
 - a. Consider budget available for project
 - b. Determine if cleaning is required. Refer to Cleaning Specification.
 - c. Determine technologies required (Pan and Tilt or Side Wall Scanning)
 - d. May need to consult with other Owners or experts to compile reasonable cost estimates

3. Create a detailed project map from existing conveyance system maps to include as much information as possible
 - a. Pipe size
 - b. Scheduled pipe length
 - c. Material
 - d. Age of sewer
 - e. Depths
 - f. Shapes
 - g. Determination if debris in sewer is hazardous
 - h. Potential hazards in sewer (ex. H₂S, explosive, corrosive)

4. Gather data on area(s) of CCTV project
 - a. Accessibility
 - b. Restrictions
 - c. Environmental issues
 - d. Water access and costs
 - e. Dumping availability and costs

5. Write Bid Specifications:
 - a. Define types of inspection
 - b. Define level of cleaning expected (95%) for CCTV
 - c. Establish verification method (CCTV-PACP)
 - d. Establish payment method and schedule
 - e. Include the time frame for completion and possible liquidated damages if not completed on time
 - f. Establish mandatory pre-bid meeting to:
 - i. Ensure that everyone understands your expectations
 - ii. Interview the bidding Contractors
 - iii. Eliminate bidders claiming they were not informed of something and did not bid accordingly and who may request unsubstantiated extras during the project
 - iv. Ensure that there are interested bidders knowledgeable about your project and not an uninformed bidder, etc.
 - v. Establish method to work out differences to prevent issues later in project
 - g. Define required deliverables
 - h. Establish payments/ responsibility/ location for water usage and
 - i. Helps prevent change orders and issues with inspections
 - ii. Establishes when and how work may be billed
 - iii. Outlines which party is responsible for each activity
 - iv. Define liability for damages to help prevent defaults and lawsuits
 - i. Define liability for stuck equipment and damaged utility
 - i. Make it clear, who will retrieve stuck equipment and who will pay for retrieval of equipment and repair of sewer
 - ii. Established when each party is responsible

6. Publish Project Notice in local, regional papers, plan houses, etc.
7. Pre-qualify Potential Bidders
 - a. Review Bids
 - b. Check References
 - c. Verify quality of work / timeliness and quality of deliverables
 - d. Verify Certifications and experience
8. Hold Mandatory Pre-Bid Meeting
9. Receive and Open Bids
10. Review Bid Packets and Make Award Recommendation
11. Award Bid
12. Issue Notice of Award
13. Receive and Review Contract Required Documents (insurance, bond, etc.)
14. Issue Notice to Proceed
15. Hold Mandatory Pre-Construction Meeting to include Field Personnel
 - a. See Mandatory Pre-bid and Pre-construction Project Meetings
 - b. Reinforces all issues in contract and clarifies any questions from field personnel
16. Begin Project
17. Weekly Update Meetings
 - Deals with Problems and issues early
18. Receive Lien Release(s)
19. Issue Notice of Completion
20. Issue Final Payment
21. End Project Meeting
22. Close Project

MANDATORY PRE-BID/PRE-CONSTRUCTION AND PROJECT MEETINGS

Making these meetings are mandatory and will ensure the full understanding and project requirements by both the Contractor and Owner.

PRE-BID MEETINGS

CONTRACTORS MUST ATTEND A MANDATORY PRE-BID CONFERENCE at the (Location) located at (Address) at (Time/Date) to discuss the Bidding Documents. **CONTRACTORS WHO DO NOT ATTEND THE PRE-BID CONFERENCE WILL BE DISQUALIFIED FROM THE BIDDING PROCESS.**

The purpose of this **MANDATORY PRE-BID** meeting is to ensure that all companies bidding on the project fully understand the scope of work, definitions and interpretation of all items in the bid documents. Questions may be answered at the MANDATORY PRE-BID; However all questions will be required to be submitted in writing by (Date) to the (Owner and email address) and will be addressed in addendum, Questions and answer will be distributed to all attendees at the **MANDATORY PRE-BID** meeting.

PROJECT MEETINGS

- A. Pre-Construction Meeting - **MANDATORY See attendance requirements below**
- B. Progress Meetings - **Attendance requirement to be determined by the Owner prior to the scheduled meeting.**
- C. Project Completion Meeting - **Attendance requirement to be determined by the Owner prior to the scheduled meeting.**

MANDATORY PRE-CONSTRUCTION MEETINGS

The Owner will schedule a Pre-Construction Meeting to:

- A. Finalize communication and coordination protocols
- B. Review the Final Planning Document with special attention to:
 - 1. Schedule
 - 2. Public notification
 - 3. Traffic control
 - 4. Flow control
- C. Discuss the ensuing field work prior to starting the project. This meeting may be held at a location designated by the Owner. The purpose of this meeting is to ensure that the successful bidder fully understands and will comply with all contract documents and Owner requirements.

Guidelines for the Pre-Construction Meeting

- A. Schedule: No later than 15 days after date of Notice to Proceed
- B. Location: A central site, convenient for all parties, designated by the Owner

C. Attendance:

1. Owner or Owner's Representative
2. Owners Inspector
3. Supervising Engineer
4. Contractor's Representative
5. Contractor's Project Manager or Representative
6. Contractor's Superintendent
7. Major Subcontractors
8. Major Suppliers
9. Others, as appropriate

D. Suggested Agenda

1. Distribution and discussion of
 - a. List of Major Subcontractors and Suppliers
 - b. Projected construction schedules
2. Critical work sequencing
3. Major equipment deliveries and priorities
4. Project coordination
 - a. Designation of responsible personnel
 - b. Communication protocol
5. Procedures and processing of
 - a. Field decisions
 - b. Requests for Information
 - c. Submittals
 - d. Deliverables
 - e. Change Orders
 - f. Applications for Payment
6. Procedures for Maintaining Record Documents
7. Use of premises
 - a. Office, work and storage areas
 - b. Owner's requirements
8. Construction Facilities, Controls and Construction Aids
9. Temporary Utilities

PART 1 - GENERAL

1.1 SCOPE OF SERVICES AND WORK PHASING

- A. The purpose of this bid is to obtain competitive unit prices for all labor, material, and equipment necessary to inspect via closed-circuit television (CCTV) existing sewers. The work includes remote televising and recording of the sewer. All project locations will be within the Owner's service area.
- B. The work to be completed on each section of sewer will be performed in phases as defined in the following:
 - 1. Phase 1: Inspection.
 - a. Sewer sections shall be inspected by means of remote CCTV. If a blockage hampers the inspection of the sewer in one direction, then the Contractor shall attempt to complete the section by televising from the other manhole to complete the section. The Contractor must immediately report the obstruction to the Owner or his representative (hereinafter referred to as "Owner"). All CCTV work shall conform to Current NASSCO-PACP standards.
 - b. CCTV inspections will be delivered entirely in electronic format.
 - 1. All PACP Header information shall be completed in accordance with PACP Guidelines. In addition to mandatory Header fields, additional fields are required as noted on the attached Header Field Matrix.
 - 2. The documentation of the work shall consist of PACP CCTV Reports, PACP database, logs, electronic reports, etc. noting important features encountered during the inspection. The speed of travel shall be slow enough to inspect each pipe joint, tee connection, structural deterioration, infiltration and inflow sources, and deposits, but should not, at any time, be faster than 30 feet per minute, except as noted otherwise in this document.
 - 3. The camera must be centered in the pipe to provide accurate distance measurements to provide locations of features in the sewer and these footage measurements shall be displayed and documented on the video. All PACP Observations shall be identified by audio and on PACP log. All video must be continuously metered from manhole. The pipe should be clean enough to ensure all defects, features and observations are seen and logged. If cleaning is required, see NASSCO Performance Specification Guideline for Sewer Pipe Cleaning.
 - 2. Phase 2: Sewer Pipe Cleaning. Based on the Owner's review, he or she will determine if additional work will be required. The Owner, at his sole discretion, will

either declare the work on the particular sewer section complete or notify the Contractor of additional work (i.e. Phase 3: Light Sewer Cleaning, Heavy Cleaning, Deposit Cut, Root Cut Medium, Root Cut Ball, or Lateral Cut). See NASSCO Performance Specification Guideline for Sewer Pipe Cleaning.

3. Phase 3: Additional Sewer Pipe Cleaning (Optional). The Contractor shall perform the assigned additional work, which may be any one of the following items: Light Sewer Cleaning, Heavy Cleaning, Deposit Cut, Root Cut Medium, Root Cut Ball, or Lateral Cut.
4. Phase 4: Post Cleaning Inspection. Final televising of the sewer section to evaluate the condition of the sewer section after all cleaning has been performed in phase 3. Phase 4 will be required to be performed and will be reimbursed at the bid unit price.
 - a. The recorded video must show the entire circumference of the sewer. Any flow control to remove standing water and debris shall be incidental to the contract. It is not the intent of this specification to require bypass pumping to control heavy flow; however, the Contractor must, at a minimum, make reasonable effort to control the flow. The Contractor must also consider weather conditions to obtain the best video image of the sewer. This may require the Contractor to delay any video work after major rain events until the system can return to lower dry weather flow. The Contractor shall submit PACP data to include the electronic video reports, logs, etc. for the Owner's review as required in Part 1 Section 6.
 - b. The sections of sewer to be cleaned and televised through this contract will be located primarily within the paved areas of the public right-of-way; however, there may be some sewer sections that are located within public easements on private property. The successful bidder will be responsible to coordinate and gain access to any and all sewer sections and will be responsible for any restoration in accordance with Part 3 Section 3.7. This will include written authorization between Contractor and landowner. Costs associated with access will be included with other items bid in this contract.
- C. The Contractor shall furnish all labor, components, materials, tools, and appurtenances necessary for the performance and completion of the contract.
- D. Award of the contract will be determined through an evaluation of bids and in the best interest of the Owner.
- E. The Contractor will be held fully liable for any damages incurred that are caused by his or her negligence.
- F. Patents, Trade Secrets, and Copyrights: The Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the work or

the incorporation in the work of any invention, design, process, product or device which is the subject of patent rights, trade secrets protection rights, or copyrights held by others. The Contractor shall indemnify and hold harmless the Owner and Engineer and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorney's fees and court and arbitration costs) arising out of any infringement of patent rights, trade secret protection rights, or copyright incident to the use in the performance of the work or resulting from the incorporation in the work of any invention, design, process, product or device not specified in the contract documents, and shall defend all such claims in connection with any alleged infringement of such rights.

1.2 OWNER

This contract will be administered and performed under the direction and inspection of the Owner or his designated representative. Questions pertaining to this contract, before and after award, should be directed to the Owner at (Phone Number) and (e-mail address)

1.3 TIME OF PERFORMANCE, SCHEDULING AND LIQUIDATED DAMAGES

- A. Upon award of the contract, the Contractor shall CCTV at least three (3) segments or 1,000 feet of pipe and submit the data to the Owner to verify that the CCTV database is compatible with the Owner's PACP Database, and the deliverables are acceptable to the Owner. The Owner shall verify acceptability of the deliverables within five (5) business days of receipt. After the Owner verifies compatibility of the inspection deliverables including the database, the Owner shall then issue to the Contractor a written "Notice to Proceed" including a date for commencement of work. The Contractor shall begin work on the date stated in the written "Notice To Proceed" (but no later than 10 calendar days after receipt) with an adequate force and sufficient resources to demonstrate due diligence in the performance of the contract.
- B. It is understood that the bidder may have other contracts with the Owner during the period of this contract. By bidding this work, the bidder is agreeing to provide an adequate number of crews in order to perform the work concurrently with due diligence and as specified in his approved schedule.

1.4 COMPLIANCE AND ACCEPTANCE

- A. Compliance with this contract shall be complete when all conditions set forth in these specifications have been met. The following defines each work item, the level of effort, and quality of work that will be necessary to meet the intent of this specification.

B. Television Inspection

1. As in the initial survey television inspection pay item, CCTV inspections will be delivered entirely in electronic format.
2. All CCTV work shall conform to the most current NASSCO PACP standards. The documentation of the work shall consist of NASSCO PACP CCTV Reports, NASSCO PACP database, logs, electronic reports, etc. noting defects and observations encountered during the inspection.

1.5 REFERENCED DOCUMENTS

A. All work must also conform to the latest edition of the following specifications (as required in advance by the Owner)

1. NASSCO PACP Standards
2. State Department of Transportation, Construction and Materials Specification
3. Rules and Regulations and Standard Drawings
4. Rules and Regulations of the Office of the City/County Engineer
5. Others, as required

B. Liability and Assumptions

In order to minimize and appropriately allocate costs and risks, it is in the best interest of all contracted parties (Owner and Contractor) and prospective parties (i.e. Bidders) to understand thoroughly the risks associated with any particular project. For that reason we will define herein, what is standard practice in the procurement and completion of sewer cleaning and inspection so that everyone involved can effectively assess their obligations, risks and duties. Liability for removal of equipment that becomes stuck in the sewer should be discussed in the contract.

1. Negligence Caused – Contractor
2. Owner Decision to proceed after concerns raised – Owner
3. Unforeseen Hazard (I.E. hole in pipe under flow line and not visible) – To be discussed in advance to mutually agree upon liability based on the CCTV leading up to the hazard.

C. Assumptions

1. It is reasonable and customary to assume the following, unless otherwise detailed in writing:
 - a. The Owner has provided the Parties (Contractor and/or Bidders), in writing, with all of the information that the Owners possess that would allow the Parties to accurately and fully assess the entire scope of the project.
 - b. The Owner possesses or has contracted the services of a person or entity who possesses the knowledge, expertise and experience to fully understand the scope of the service for which they are attempting to contract with the Parties.
 - c. The Parties are knowledgeable, capable and legally authorized to contract for the services in question.

- d. The infrastructure for which the services are requested are in suitable condition to allow for the activities which are usual and customary for the services requested without undue risk to the Parties equipment or personnel, unless otherwise described by the Owner in writing.

D. Liabilities

Should it be found during initial investigation and/or during the course of performance that conditions are different than those which are typical and customary and outside of the assumptions listed above, the Contractor may negotiate a reasonable change in terms. If the Owner and the Contractor cannot agree on a change in terms, the Owner reserves the right to re-bid or cancel such work.

E. Notification

1. If observed defects are believed to be such that further operations may compromise the structural integrity and/or cause the pipe to become unusable, the Contractor must provide written communication to the Owner's designee of the observed condition(s) and reason to believe that continued operations may cause substantial damage. The Owner will then direct the Contractor as to what services, precautions, etc., the Owner will require of the Contractor. If the contract documents do not address this potential, then the Owner and Contractor will negotiate in good faith, the conditions under which the work is to continue or cease to continue.
2. This exception may only be used to prevent asset damage and shall not be used to eliminate difficult or adverse areas that were previously documented in these documents or by prior written communication with the Owner.

1.6 SUBMITTALS

- A. All submittals are due as scheduled. Work will not proceed until all submittals are received and approved. The Owner reserves the right to adjust the due dates of the submittals based on Contractor performance. The Contractor shall label each submittal indicating what is represented, name of Contractor, and project number. All submittals identified as being in error shall be re-performed and corrected at the Contractor's expense.
- B. Submittals Required with Bid Documents include:
 1. List of references per Part II Section 7
 2. Documentation of Certification of PACP Software
- C. Liability Insurance
 1. The Contractor's commercial general liability limits must be not less than \$____, total occurrence limit
 2. Liability Insurance. Seven (7) days prior to the pre-construction meeting, the Contractor shall submit written evidence that it has obtained commercial general liability limits must be not less than \$____, total occurrence limit. Owner shall be

named as an additional insured with respect to General Liability, and shall identify additional insured parties, such as the General Contractor, as applicable, with respect to General Liabilities

- D. Submittals required of the Successful Bidder seven (7) days prior to the Pre-construction Meeting
 - 1. Name of the project supervisor and resumes
 - 2. Documentation of NASSCO PACP certification for all CCTV operators, database and software
 - 3. Site Safety Plan. A complete site safety plan, specific for the project, must be submitted one week prior to the pre-construction meeting. Work will not begin until an approved site safety plan is in place
 - 4. Sample inspection CCTV data and video or data from other approved inspection method

- E. Submittals Required for the Pre-construction Meeting
 - 1. An initial comprehensive schedule of work, see Part IV, Paragraph D (To be approved by the Owner)
 - 2. Management Organization: Provide an organization chart depicting the essential organizational elements and senior personnel of the proposed Contractor and the functions and interrelationships of the personnel proposed to provide technical support, project management and supervision for this project. Provide succinct resumes of the personnel proposed to provide technical support and project management for this project. The personnel designated in the management summary for essential positions shall not be changed except with the permission of Owner. The Owner will only approve such a change when, in its opinion, the substitute personnel have equal or greater qualifications and experience to those intended to be replaced
 - 3. Proof that Contractor is an approved/bonded Contractor with the Owner

- F. Submittals Required One Week Prior to Any Cleaning & Televising Work
 - 1. Site specific site safety plan addenda
 - 2. Entry releases, if applicable

- G. Weekly Submittals
 - 1. Detailed updates to the work schedule will be provided to the Owner no later than 1:00 p.m. on the Friday preceding the next week's cleaning and televising work
 - 2. Electronic data and video/scan submittals, logs, and / or electronic worksheets submitted seven (7) days prior to work. All field paperwork must be submitted before the Contractor's invoice will be processed for payment
 - 3. Corrections to punch list items as required by the Owner to fulfill the requirements of this specification

- H. Final Submittals Prior to Payment
 - 1. Corrections to punch list items as required by the Owner to fulfill the requirements of this specification

PART 2 - SPECIAL PROVISIONS

2.1 OWNER RIGHTS

- A. The Owner reserves the right to stop the work when in the Owner's judgment the Contractor's work or activities are threatening the health and safety of the public or endangering the environment or endangering the waters of the state. Work shall not proceed until a satisfactory resolution has been achieved, according to the Owner.
- B. No Contractor or Subcontractor will perform any work not specifically identified in the work schedule unless approved by the Owner. Notification of such work must be received no later than 8:00 a.m. on the day the work is to be performed. A list of persons available to be notified will be given at the pre-construction meeting.

2.2 EMERGENCY RESPONSE

The Contractor shall provide direct contact information to the Owner. These numbers are intended for the Owner's use in contacting the evening/weekend/holiday emergency work crew for emergencies resulting from the Contractor's actions or lack thereof during this project. This crew shall be responsible for contacting the Owner within one-half hour after the first verbal and electronic notification. If the Contractor's crew has not responded to the site of the emergency within one hour of the first contact, verbal and electronic, the Owner will make all necessary repairs and bill the Contractor for all work performed. Costs related to the emergency response will be incidental to the contract and not measured for payment.

2.3 WORKING HOURS

- A. The Contractor must complete all work such that no homeowner is without sewer service, unless otherwise directed by the Owner. Local noise ordinances or agencies having control over roadway closures may control starting or stopping operations. Prior to starting operations, the Contractor shall advise the Owner of the restrictions imposed by the local agencies.
- B. The Contractor may be required to work days, nights or weekends to achieve the lowest depth flows in the sewer pipes and not conflict with public events.
- C. **No work will be allowed on weekends or holidays** except at the discretion of the Owner.

2.4 DECREASE/INCREASE IN SERVICE AND STOP WORK DUE TO INCLEMENT WEATHER

The Owner, at its option, may increase or decrease any or all service requirements provided for under this contract. The Owner further reserves the right to suspend or stop the performance of any or all of the work of this contract due to inclement weather conditions.

2.5 PRE-CONSTRUCTION MEETING

A. Following award of the contract and before starting any work the Contractor, Job Superintendent/Project Manager, and Crew Leader shall meet with the Owner. The Contractor will be notified of the date, time, and place of the meeting.

B. Attendance:

1. Owner
2. Owner's Inspector
3. Engineer
4. Contractor's Representative(s)
5. Major Subcontractors
6. Major Suppliers
7. Others, as appropriate

C. Agenda:

1. Distribution and Discussion
 - a. List of major Subcontractors and Suppliers
 - b. Projected Construction Schedules
2. Critical Work Sequencing
3. Major Equipment Deliveries and Priorities
4. Project Coordination
 - a. Designation of responsible personnel
5. Procedures and Processing
 - a. Field decisions
 - b. Requests for Information
 - c. Submittals
 - d. Deliverables
 - e. Change Orders
 - f. Applications for Payment
6. Procedures for Maintaining Record Documents
7. Use of Premises
 - a. Office, work and storage areas
 - b. Owner's requirements
8. Construction Facilities, Controls and Construction Aids

9. Procedures for reporting Sanitary Sewer Overflows (SSOs)
10. Temporary Utilities

2.6 CLOSE-OUT PROCEDURES

Progress Meetings: Project closeout will be completed in phases by project. The Owner will hold progress meetings at predetermined intervals, or as determined necessary by the Owner. Items covered in the meetings include the following.

1. Punch List: This list will detail all items requiring correction, repair, or improvements in order to be accepted. The Contractor will address these items within 7 calendar days or as specified by the Owner. Failure to complete punch list items will result in a stop work notice and delay of payment until completed to the satisfaction of the Owner.
2. Reports and Submittals: Final reports, post-tapes and other submittals previously described will be finalized and submitted.
3. Review of the status of pay estimates.
4. Issue project worksheets, as necessary.
5. Work scheduling issues.

2.7 PRE-QUALIFICATIONS

- A. The successful bidder must have an onsite field supervisor with a minimum three (3) years of experience specializing in the televising of sewers. A foreman for each crew performing television inspection with a minimum of five years of experience specializing in that type of work may be substituted for the onsite field supervisor requirement. The Contractor shall provide the names, titles, phone numbers and addresses of a minimum of two references that can be used to verify this experience. The references must be contract managers or persons of authority over cleaning and televising work performed by the Contractor.
 1. The Contractor shall also provide five (5) similar projects with inspection equipment as proposed for this project.
 2. The Contractor must have foreman or supervisors meeting all pre-qualifications for the duration of the contract.
- B. PACP Requirements
 1. Current NASSCO PACP certification of all CCTV operators, working on this project, will be required for all CCTV work.
 2. Database shall be an NASSCO-PACP (Current Version) Certified Access Database.
 3. CCTV Software shall be NASSCO-PACP (Current Version) certified.
 4. CCTV inspections (Video and Data Collected) will be delivered entirely in digital format.

PART 3 - GENERAL PROVISIONS

3.1 MAINTENANCE OF TRAFFIC

- A. The Contractor shall be responsible for maintaining "local" traffic at all times and for notifying the proper authorities regarding the closing of the roads. The Contractor will be responsible for obtaining all permits required for maintenance of traffic.
- B. The Contractor shall not begin work until standard barricades and warning signs are in an acceptable position and the markers and signs conform to the Federal Highway Administration (FHWA) "Manual of Uniform Traffic Control Devices for Streets and Highways" and all applicable state and local requirements. The Contractor assumes all responsibilities and liabilities regarding strict adherence to applicable sections for the maintenance of traffic and public safety as set forth in the FHWA "Manual of Uniform Traffic Control Devices for Streets and Highways", and other applicable regulations. All traffic control devices must be in place prior to starting work.
- C. The cost of all traffic control devices shall not be paid separately, but shall be included in the other price items in the contract.
- D. The Contractor shall maintain local traffic at all times during all phases of this project in a manner causing the least amount of inconvenience to the abutting property Owners. Temporary driveways, temporary roadways, or run around as may be necessary to provide vehicular access to and from the abutting properties shall be constructed, maintained, and subsequently removed by the Contractor as directed by the Owner.
- E. The portion of the pavement not affected by the work shall be kept clear of all material and equipment.
- F. The Contractor shall hold harmless the Owner and all its representation from all suits, actions, of claims of any character brought on account of any injuries or damages sustained by any person or persons or property in the performance of this contract.
- G. If at any time traffic has to be blocked (emergencies only), the Contractor shall notify the nearest fire, police departments and service departments.
- H. The cost of maintenance of traffic shall be incidental to the contract and not measured for payment.

3.2 EXISTING UTILITIES

- A. The Contractor must take the necessary precautions for the protection of any utility encountered on the project or the restoration of any utility damaged during the work.

- B. If an excavation is required, the Contractor shall notify, at least 48 hours before breaking ground, all public or private service corporations having wire, poles, pipes, conduit, manholes, or other structures that may be affected by this operation, including all structures which are affected and not shown on these plans. Owners of underground utilities, which are members of the state's one call service, can be notified by calling. Non-member underground utility Owners must be called directly.
- C. All maintenance, repair, and replacement of existing utilities shall be in accordance with the rules and regulations of the various utility companies having jurisdiction.
- D. All existing storm sewers, driveway drains, surface drain pipes and other property, removed or damaged during construction shall be repaired and reconnected by the Contractor as directed by the Owner at no additional cost to the Owner.

3.3 REQUEST FOR SUPPLEMENTARY INFORMATION

- A. It shall be the responsibility of the Contractor to make timely requests of the Owner for supplemental information, which should be furnished by the Owner under the terms of this contract, and as required in the planning and execution of the work. Such requests may be submitted from time to time as the need approaches, but each shall be filed in ample time to permit appropriate action to be taken by all parties involved to avoid delay.
- B. Each request shall be in writing, and list the various items and the latest day by which each will be required by the Contractor. The first list shall be submitted within two (2) weeks after contract award and shall be as complete as possible at that time. The Contractor shall, if required, furnish promptly any assistance and information the Owner may require in responding to these requests of the Contractor. The Contractor shall be fully responsible for all delays arising from failure to comply with this section.

3.4 USE OF PREMISES

- A. The Contractor shall not trespass upon or in any way disturb private property without first obtaining written permission from the property Owner and/or Owner or Prime Contractor as appropriate to do so. A copy of such written permission shall be furnished to the Owner prior to accessing the site.
- B. It shall be the Contractor's responsibility to work equipment around poles, trees, or other obstructions and to do so at his own expense.
- C. If the Contractor finds it necessary to obtain additional working area, it shall be the Contractor's responsibility for its acquisition.

- D. The Contractor shall, at no additional expense, restore such property to the original condition in the sole and unfettered opinion of the system Owner. The Contractor must take photographs and/or videos of existing properties prior to disturbance of each property, and make a copy available to the system Owner.
- E. All items within the street right-of-way or sewer easement shall be removed, or removed and replaced, or restored as directed by the Owner.
- F. The Contractor shall ensure all employees have a badge or visible identification during any time that they are on the project site or within private property. This identification must be worn so that it is readily recognized and readable to the public.

3.5 PROTECTION OF TREES

The Contractor shall avoid any unnecessary damage to trees. Branches which overhang the project limits and which interfere with the operation of equipment shall be tied back to avoid damage, if possible. Where injury to branches is unavoidable, the branches shall be sawed off neatly at the trunk or main branch, and the cut area shall be protected with approved pruning spray immediately. The Contractor at no additional expense shall remove any trees damaged beyond saving, and make restitution to the Owner (public or private).

3.6 FENCING

Any fences, including hedges and shrubs, that need to be removed to facilitate the work shall be replaced, in kind or with repairs satisfactory to the Owner, at the Contractor's expense. Replacement of fences, hedges, and shrubs shall be considered incidental to the contract and not measured for payment.

3.7 RESTORATION

- A. All roadway berms and drainage ditches disturbed by the work shall be restored, reshaped, and graded to drain.
- B. Pavement restoration, if necessary, shall conform to the Owner's regulations, or the Owner's Specifications depending upon who has jurisdiction for the street. Trench backfill and compaction shall be in conformance with the local street restoration jurisdiction.
- C. The remediation of sunken trenches caused by activities conducted in this contract shall be the Contractor's responsibility. Sunken areas shall be backfilled and compacted to meet adjoining grades; the surface shall be re-seeded or resurfaced with asphalt or concrete matching the existing surfacing.

- D. The Contractor shall restore unpaved areas by seeding and mulching. No direct payment will be made for seeding and mulching.
- E. Driveways shall be restored in accordance with Owner's regulations, or the Owner's Specifications depending upon who has jurisdiction for the driveway.
- F. All disturbed areas shall be restored as nearly as possible to their original condition.
- G. All restoration shall be completed in strict accordance with the appropriate items of the specifications as directed by the Owner.
- H. The cost of all restoration of streets, drives, walks; sod, etc. shall be incidental to the contract and not measured for payment.
- I. Restoration shall be kept current with the project work. Failure to keep restoration of these items completed reasonably close shall result in a stop work notice and delay of payment until such restoration is completed to the satisfaction of the Owner.

3.8 CLEANUP

The Contractor shall keep the work area in an uncluttered condition by the frequent removal of debris. The Contractor shall remove all debris and unused material and leave the area in a condition similar to the condition of the area before any work was performed.

3.9 PROPERTY DAMAGE

- A. The Contractor shall immediately investigate any and all reports of sewage backing up into fixtures served by the sewer section that is being cleaned or televised.
- B. The Contractor will be required to notify the Owner immediately if he causes any damage to private or public property caused by activities related to this contract. The Contractor shall make repairs and/or clean the property immediately in a timeframe that is acceptable to the Owner.

3.10 ACCESS TO MUNICIPAL WATER SUPPLIES

Should be addressed by individual Owner.

PART 4 - EXECUTION

4.1 GENERAL

- A. The Contractor shall furnish and maintain, in good condition, all cleaning and televising equipment necessary for proper execution of the work.

- B. Maintaining Flow: It will be the responsibility of the Contractor, throughout the tenure of this contract, to provide and maintain sufficient flow at all times to pass any flash of storm flow of drainage ditches and prevent any backwater flooding due to obstruction caused by cleaning or CCTV equipment.
- C. Retrieval of Materials and Equipment: It shall be the Contractor's responsibility to remove materials and equipment that has been lodged in the sewer from cleaning, television inspection, or point repair excavations.
- D. Work Schedule. This schedule shall outline the sequence in which the Contractor proposes to conduct his operations and shall be approved by the Owner before work is started. The Contractor shall use a time-scaled logic diagram format. The level of detail of activities shall provide clear, concise communication of the plan of work. At a minimum, activities showing initial mobilization, start-up, cleaning and televising, and any resultant point repairs shall be included.
- E. Original and updated schedules must be provided to the Owner in writing. The software used for producing the schedules must have the capability to tailor the form and format of schedules, and accompanying reports, to the Owner's requirements.
- F. The Owner may require additional updates to the schedule as changes occur. These additional updates will be submitted to the Owner within 24 hours of the request. Changes to the schedule are subject to approval of the Owner.

4.2 TELEVISION INSPECTION AND COMPUTERIZED EQUIPMENT

- A. The Contractor shall use a color pan and tilt camera or a side wall scanning (panoramic) camera specifically designed and constructed for sewer inspection. Each sewer to be televised shall be suitably isolated to control flow during the inspection. The Contractor shall provide a recording of the televised sewer inspection, locating each sewer service connection entering the sewer.
- B. Lighting for the pan and tilt camera or side wall scanning camera shall provide a clear picture of the entire periphery of the existing sewer.
- C. The pan and tilt camera shall pause, pan, and visually inspect all service connections, pipe ends, and maintenance or structural defects. If utilizing a camera with side wall scanning capabilities, pausing and panning of each lateral is not necessary during the inspection if the image clearly depicts the inside of the lateral for post processing. If a blockage cannot be removed and hampers the televising of the sewer in one direction then the Contractor shall attempt to complete the section by televising from the other manhole to complete the section, this reversal should immediately follow the initial direction. The Contractor must immediately report the obstruction to the Owner.

- D. Side wall scanning inspection systems are imaging cameras that are capable of a continuous 360 degree image capture of the wall of the pipeline being inspected. These systems may have one or multiple cameras to capture the complete interior view of the pipeline. Due to the high resolution of the image quality, the inspections may be conducted at a higher speed than color pan and tilt CCTV method. Once the pipeline inspections are completed, the captured images can be linked with a companion software package that allows for identifying and coding defects and features in the pipeline. Typically these systems provide a fold flat view and a perspective view (typical of CCTV) of the pipeline.

- E. If the image quality is not adequate for post-inspection coding, the Contractor shall be required to repeat the survey at the Contractor's expense.

- F. The Contractor shall perform all CCTV inspections in accordance with NASSCO's Pipeline Assessment Certification Program (PACP). CCTV inspections will be delivered entirely in electronic format. The entire survey shall be recorded in an approved electronic format submitted with electronic links between the data and the video. All television inspection reports shall be with-in +/- two (2) feet of the measured linear footage between manholes along the existing sewer centerline from the start of pipe to end of pipe. All Owner and PACP required header information must be fully and accurately entered on all CCTV reports. Work not following these specifications may be rejected for payment and the Contractor may be required to re do the work.

- G. The Contractor shall provide a PACP certified operator on site at all times during the entire survey. If video is to be coded separately from the actual recording, both the onsite Operator and the individual performing the PACP coding shall be PACP certified. The Contractor shall provide proof of certification prior to commencement of work, prior to a change in personnel involved in data collection, and as requested by the Owner

- H. CCTV Reports, logs, electronic reports, and worksheets must include the following information and conform to the applicable guidelines:
 - 1 CCTV Reports, NASSCO PACP Certified Database, and electronic worksheets must accompany all inspection work.
 - 2 All Owner and NASSCO PACP required header information must be fully and accurately entered on all CCTV reports.

PART 5 - PAYMENT FOR WORK

5.1 MEASUREMENT AND PAYMENT

- A. In cases where the sewer is entirely inspected manhole-to-manhole, payments will be based on the measured linear footage between manholes along the existing sewer centerline from manhole wall to manhole wall at the unit price submitted on the unit price page.
- B. All invoicing will be by sewer segment, and payment and will be made when all punch list items and rework are completed for each Sewer Segment. Additional work shall be invoiced and paid upon completion.
- C. The following items of work will not be measured for payment but the cost thereof will be considered as incidental to the contract:
 - 1 Data entry, computerized equipment, software, and hardware to submit the required electronic submittals, including the DVDs, records, and logs.
 - 2 Completion of all electronic forms.
 - 3 Photographic equipment and supplies used to show sewer pipe and manhole defects.
 - 4 Bypass pumping and flow control where required by the Contractor to perform his or her work.
 - 5 Providing temporary and final paving at any proposed excavations.
 - 6 Providing temporary and final restoration of grass areas.
 - 7 Emergency after-hours response.
 - 8 Re-televising and re-cleaning following a point repair completed by the Contractor.
 - 9 Demobilization and mobilization because of suspension of work.
 - 10 Updates to the schedule as required by the Owner.
 - 11 Right of entry access to private property.
 - 12 Dye testing of service connections in order to meet the CCTV specification.
- D. In order for the Owner to properly and accurately track costs of the contract, the Contractor shall submit the final invoice on each project within 30 days after the completion of the project.
- E. Performance and Payment Bond: The bond securing the performance of the contract shall be effective for the full maximum period of the contract including the optional renewal period(s) specified. The bond amount indicated shall be deemed adequate surety for the initial and optional renewal periods. The cost of performance surety shall be treated as an overhead expense and shall be included in the bid amounts. The Owner shall not pay the cost of surety as a direct bill item.

****END OF SECTION****

The following is an example of a Header Field Checklist requiring non-mandatory PACP fields within the specification. The specification writer is responsible for determining which additional fields are required.

HEADER FIELD CHECKLIST

Field #	Header Field	Mandatory	Required for this Project
1	Surveyed By	X	
1a	Certificate No.	X	
2	Owner		
3	Customer		
4	Drainage Area		
5	Sheet Number	X	
6	P/O Number		
7	Pipe Segment Ref.		X
8	Date	X	
9	Time		
10	Street	X	
10a	City	X	
11	Location Details		
12	Upstream MH No.	X	
13	Upstream MH Rim to Invert		X
14	Upstream MH Grade to Invert		X
15	Upstream MH Rim to Grade		X
16	Downstream MH No.	X	
17	Downstream MH Rim to Invert		X
18	Downstream MH Grade to Invert		X
19	Downstream MH Rim to Grade		X
20	Sewer Use		X
21	Direction	X	
22	Flow Control		
23	Height	X	
24	Width	X	
25	Shape	X	
26	Material	X	
27	Lining Method		
28	Pipe Joint Length		X
29	Total Length		X
30	Length Surveyed		X
31	Year Laid		
32	Year Renewed		
33	Media Label		
34	Purpose		
35	Sewer Category		
36	Pre-Cleaning	X	
36a	Date Cleaned		
37	Weather		
38	Location		
39	Additional Info.		
40	W/O #		
41	Project		
42	Pressure V		

CCTV CONDITION SURVEY BID SHEET (SAMPLE)

<u>WORK TYPE</u>	<u>PIPE SIZE</u>	<u>ESTIMATED FOOTAGE</u>	<u>PRICE PER FOOT</u>	<u>TOTAL PRICE</u>	<u>TOTALS</u>
INSPECTION	6" TO 12"			0	
INSPECTION	13" TO 24"			0	
INSPECTION	25" TO 30"			0	
INSPECTION	Over 30"			0	
TOTAL BID					0