PROFESSIONAL, SPECIALIZED OR TECHNICAL SERVICES CONTRACT

PROJECT NO. 60810100 – ANNUAL SEWER REHABILITATION: LARGE DIAMETER CITY-WIDE SEWER INSPECTION AREA 2

WATER SERVICES DEPARTMENT

THIS CONTRACT is between KANSAS CITY, MISSOURI, a constitutionally chartered municipal corporation ("City"), and HYDROMAX USA ("Contractor"). City and Contractor agree as follows:

PART I

SPECIAL TERMS AND CONDITIONS

Sec. 1. Compensation.

A. The amount the City will pay Contractor under this contract will not exceed $750,000.00.

B. Contractor will bill the City, in a form acceptable to the City, on the following basis: Contractor will bill the City as described in Task 104 of Attachment A-Scope of Services on unit price basis and hourly rate basis as listed in Attachment C-Unit Prices.

C. It shall be a condition precedent to payment of any invoice from Contractor that Contractor is in compliance with, and not in breach or default of, all terms, covenants and conditions of this Contract. If damages are sustained by City as a result of breach or default by Contractor, City may withhold payment(s) to Contractor for the purpose of set off until such time as the exact amount of damages due City from Contractor may be determined.

D. No request for payment will be processed unless the request is in proper form, correctly computed, and is approved as payable under the terms of this Contract.

E. No request for payment will be processed unless it is accompanied by a copy of the most recent 00485.01 M/WBE Monthly Utilization Report submitted to the City's Human Relations Department.

F. City is not liable for any obligation incurred by Contractor except as approved under the provisions of this Contract.

Sec. 2. Responsibilities of Contractor. Contractor shall perform the following Scope of Services: See **Attachment A-Scope of Services.**

Sec. 3. Notices. All notices required by this Agreement shall be in writing to the following:

City: Kansas City, Department: Water Services, Director: D. Matt Bond, P.E.

Address: 4800 East 63rd Street, Kansas City, MO 64130

Phone: (816) 513-0168 Facsimile: (816) 513-0543

E-mail address: matt.bond@kcmo.org

Contractor: HYDROMAX USA, Contractor's Legal Name: HYDROMAX USA

Contact: David Hamberlin, Address: 2501 S Kentucky Ave Evansville, KY 47714

Phone: (812) 708 - 0886

E-mail address: david.hamberlin@hydromaxusa.com

All notices are effective a) when delivered in person, b) upon confirmation of receipt when transmitted by facsimile transmission or by electronic mail, c) upon receipt after dispatch by registered or certified mail, postage prepaid, d) on the next business day if transmitted by overnight courier (with confirmation of delivery), or e) three business days after the date of mailing, whichever is earlier.

Sec. 4. Merger. This Contract consists of Part I, Special Terms and Conditions and any Attachments and any documents incorporated by reference; and Part II, Standard Terms and Conditions. This Contract, including any Attachments and incorporated documents, constitutes the entire agreement between City and Contractor with respect to this subject matter.

Sec. 5. Conflict Between Contract Parts. In the event of any conflict or ambiguity between the Special Terms and Conditions of Part I and the Standard Terms and Conditions of Part II of this Contract, Part I will be controlling.

Sec. 6. Term of Contract. The work to be performed under this contract shall begin on the date specified in the written Notice to Proceed issued by the Director of Water Services Department. The work shall be completed within schedule provided in Part II of Attachment A-Scope of Services. The Director is authorized to enter in to an amendment to extend the term of this Contract and time of performance for this Contract.

The period of performance under the contract is provided in the Scope of Services at fixed and firm prices with a unilateral contractual right on the part of the City to extend this price agreement for an additional three (3) one-year periods. The Contractor's surety is only obligated to bond the initial contract and surety may choose to bond additional renewals by mutual agreement between surety and Contractor. However, the Contractor is not excused from obtaining a replacement surety should the City wish to exercise its option to renew the contract. The continuation of the incumbent Contractor in the option year(s) is a prerogative of the City and is not a contractual right of the Contractor. The City's decision in regard to exercising the option(s) is not subject to appeal. The option year prices will be determined by the City by negotiation with the Contractor. NOTE: YEARLY INCREASES ARE NOT AUTOMATIC. THE CONTRACTOR MUST PROVIDE WRITTEN PROOF THAT THE REQUIRED INCREASE IS WARRANTED.

Sec. 7. Attachments to Part I. The following documents are Attachments to Part I of this Contract and are attached hereto and incorporated herein by this reference:

Attachment A – Scope of Services
Attachment B – Electronic Data Requirements
Attachment C – Unit Costs
Attachment D - Licensed Geographical Information System Data
Attachment E – HRD Documents
100450 HRD Form 08: Contractor Utilization Plan/Request for Waiver
00450.01: Letter of Intent to Subcontract

00460 HRD Form 10: Timetable for MBE/WBE Utilization
00470 HRD Form 11: Request for Modification or Substitution
01290.14: Contractor Affidavit for Final Payment
01290.15: Subcontractor Affidavit for Final Payment

Attachment F – Performance Bond
Attachment G – Employee Eligibility Verification Affidavit
Attachment H – Non-Construction Subcontractors Listing
Attachment I – Non-Construction Application for Payment
Attachment J – Sewer Line Inspection Protocol
Attachment K – 02676 Sewer Line Cleaning Specification

Sec. 8. Responsibilities of City. See **Attachment A-Scope of Services**.

Sec. 9. Subcontracting. Contractor agrees that it will only subcontract with the subcontractor(s) it has listed on the "Subcontractor List Non-Construction."

Sec. 10. Contract Information Management System. Contractor shall comply with City's Contract Information Management System requirements. Contractor shall use City's Internet web based Contract Information Management System/Project Management Communications Tool provided by City and protocols included in that software during the term of this Contract. Contractor shall maintain user applications to City's provided system for all personnel, subcontractors or suppliers as applicable.

Sec. 11. Minority and Women's Business Enterprises. City is committed to ensuring that minority and women's business enterprises (M/WBE) participate to the maximum extent possible in the performance of City contracts. If M/WBE participation goals have been set for this Contract, Contractor agrees to comply with all requirements of City's Minority and Women's Business Enterprise Program as enacted in City's Code Sections 3-421 through 3-469 and as hereinafter amended. Contractor shall make its good faith efforts in carrying out this policy by implementing its contractor utilization plan, which is attached as **Attachment E.** If Contractor fails to achieve the M/WBE goals stated in its contractor utilization plan, as amended, the City will sustain damages, the exact extent of which would be difficult or impossible to ascertain or estimate at the time of execution of this contract. Therefore, in order to liquidate those damages, the monetary difference between the amount of the M/WBE goals set forth in this contractor utilization plan, as amended, and the amount actually paid to qualified MBEs and WBEs for performing a commercially useful function will be deducted from the Contractor's payments as liquidated damages. In determining the amount actually paid to qualified MBEs and WBEs, no credit will be given for the portion of participation that was not approved by the Director of City's Human Relations Division, unless the Director determines that the Contractor acted in good faith. No deduction for liquidated damages will be made when, for reasons beyond the control of the Contractor, the M/WBE participation stated in the Contractor Utilization Plan, as amended and approved by the Director, is not met.

Sec. 12. Performance Bond. Contractor shall furnish a Performance Bond to City on City furnished forms executed by a Surety, in the amount of $750,000.00 guaranteeing Contractor's faithful performance of each and every term of this Contract and all authorized changes.

All bonds required to be purchased and maintained by Contractor shall be obtained from surety or insurance companies that are duly licensed in the State of Missouri and in the jurisdiction in which the Project is located, if not in Missouri, to issue bonds for the limits

and coverages so required. All surety and insurance companies shall hold an A.M. Best rating of B+, V, or better. A certified copy of the agent's authority to act must accompany all bonds signed by an agent.

If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state where any part of the Project is located, Contractor shall within twenty (20) days thereafter substitute another bond and surety, both of which must be acceptable to City.

Sec. 13. Intellectual Property Rights. Contractor agrees, on its behalf and on behalf of its employees and agents, that it will promptly communicate and disclose to City all computer programs, documentation, software and other copyrightable works ("copyrightable works") conceived, reduced to practice or made by Contractor or its agents, whether solely or jointly with others, during the term of this Contract resulting from or related to any work Contractor or its agents may do on behalf of City or at its request. All inventions and copyrightable works that Contractor is obligated to disclose shall be and remain entirely the property of City. It is agreed that all inventions and copyrightable works are works made for hire and shall be the exclusive property of City. Contractor hereby assigns to City any rights it may have in such copyrightable works. Contractor shall cooperate with City in obtaining any copyrights or patents.

Sec. 19. Effectiveness; Date. This contract will become effective when the City's Director of Finance has signed it. The date this contract is signed by the City's Director of Finance will be deemed the date of this contract.

Each party is signing this contract on the date stated opposite the party's signature.

THIS CONTRACT CONTAINS INDEMNIFICATION PROVISIONS

CONTRACTOR

I hereby certify that I have authority to execute this document on behalf of Contractor

Date: _____ By: _____

Name _____

Title: _____

KANSAS CITY, MISSOURI

Date: _____ By: _____

Name: D. Matt Bond, P.E.
Title: Deputy Director

Approved as to form:

_____

Assistant City Attorney

I hereby certify that there is a balance, otherwise unencumbered, to the credit of the appropriation to which the foregoing expenditure is to be charged, and a cash balance, otherwise unencumbered, in the treasury, to the credit of the fund from which payment is to be made, each sufficient to meet the obligation hereby incurred.

_____

Director of Finance Date

PART II

STANDARD TERMS AND CONDITIONS

Sec. 1. Indemnification: Definitions

A. For purposes of this Section 1 only, the following terms shall have the meanings listed:

a. **Claims** means all claims, damages, liability, losses, costs and expenses, court costs and reasonable attorneys' fees, including attorneys' fees incurred by the City in the enforcement of this indemnity obligation.

b. **Contractor's Agents** means Contractor's officers, employees, subconsultants, subcontractors, successors, assigns, invitees, and other agents.

c. **City** means City and its agents, officials, officers and employees.

B. Contractor's obligations under this Paragraph with respect to indemnification for acts or omissions, including negligence, of City, shall be limited to the coverage and limits of insurance that Contractor is required to procure and maintain under this Contract. Contractor affirms that it has had the opportunity to recover the costs of the liability insurance required in this Contract in its contract price.

C. Contractor shall defend, indemnify and hold harmless City from and against all claims arising out of or resulting from all acts or omissions in connection with this Contract caused in whole or in part by Contractor or Contractor's Agents, regardless of whether or not caused in part by any act or omission, including negligence, of City. Contractor is not obligated under this Section to indemnify City for the sole negligence of City.

D. Nothing in this section shall apply to indemnification for professional negligence which is specified in a separate provision of this Contract.

E. In no event shall the language in this Section constitute or be construed as a waiver or limitation of the City's rights or defenses with regard to sovereign immunity, governmental immunity, or other official immunities and protections as provided by the federal and state constitutions or by law.

Sec. 2. Indemnification for Professional Negligence.

If this contract is for professional services, Contractor shall indemnify, and hold harmless City and any of its agencies, officials, officers, or employees from and against all claims, damages, liability, losses, costs, and expenses, including reasonable attorneys' fees, arising out of any negligent acts or omissions in connection with this Contract, caused by Contractor, its employees, agents, subcontractors, or caused by others for whom Contractor is liable, in the performance of professional services under this Contract. Contractor is not obligated under this section to indemnify City for the negligent acts of City or any of its agencies, officials, officers, or employees.

Sec. 3. Independent Contractor.

Contractor is an independent contractor and is not City's agent. Contractor has no authority to take any action or execute any documents on behalf of City.

Sec. 4. Insurance.

A. Contractor shall procure and maintain in effect throughout the duration of this Contract insurance coverage not less than the types and amounts specified in this section. In the event that additional insurance, not specified herein, is required during the term of this Contract, Contractor shall supply such insurance at City's cost. Policies containing a Self-Insured Retention are unacceptable to City unless City approves in writing the Contractor's Self-Insured Retention.

1. Commercial General Liability Insurance: with limits of $1,000,000 per occurrence and $2,000,000 aggregate, written on an "occurrence" basis. The policy shall be written or endorsed to include the following provisions:

a. Severability of Interests Coverage applying to Additional Insureds

b. Per Project Aggregate Liability Limit or, where not available, the aggregate limit shall be $2,000,000.

c. No Contractual Liability Limitation Endorsement.

d. Additional Insured Endorsement, ISO form CG20 10, or its equivalent.

2. If applicable, Workers' Compensation Insurance, as required by statute, including Employers Liability with limits of:

Workers' Compensation Statutory Employers Liability $100,000 accident with limits of:

$500,000 disease-policy limit
$100,000 disease-each employee

3. Commercial Automobile Liability Insurance: with a limit of $1,000,000 written on an "occurrence" basis, covering owned, hired, and non-owned automobiles. If the Contractor owns vehicles, coverage shall be provided on an "any auto" basis. If the Contractor does not own any vehicles, coverage shall be provided on a "hired autos" and "nonowned autos" basis. The insurance will be written on a Commercial Business Auto form, or an acceptable equivalent, and will protect against claims arising out of the operation of motor vehicles, as to acts done in connection with the Agreement, by Contractor.

4. If applicable, Professional Liability Insurance with limits per claim and annual aggregate of $1,000,000.

B. The Commercial General Liability Insurance specified above shall provide that City and its agencies, officials, officers, and employees, while acting within the scope of their authority, will be named as additional insureds for the services performed under this Contract. Contractor shall provide to City at execution of this Contract a certificate of insurance showing all required endorsements and additional insureds. The certificates of insurance will contain a provision stating that should any of the policies described in the certificate be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

C. All insurance coverage must be written by companies that have an A.M. Best's rating of "A-V" or better, and are licensed or approved by the State of Missouri to do business in Missouri.

D. Contractor's failure to maintain the required insurance coverage will not relieve Contractor of its contractual obligation to indemnify the City pursuant to Sections 1 and 2. If the coverage afforded is cancelled or changed or its renewal is refused, Contractor shall give at least thirty (30) days prior written notice to City. In the event of Contractor's failure to maintain the required insurance in effect, City may order Contractor to immediately stop work, and upon ten (10) days notice and an opportunity to cure, may pursue its remedies for breach of this Contract as provided for herein and by law.

E. In no event shall the language in this Section constitute or be construed as a waiver or limitation of the City's rights or defenses with regard to sovereign immunity, governmental immunity, or other official immunities and protections as provided by the federal and state constitutions or by law.

Sec. 5. Governing Law.

This Contract shall be construed and governed in accordance with the laws of the State of Missouri without giving effect to Missouri's choice of law provisions. The City and Contractor: (1) submit to the jurisdiction of the state and federal courts located in Jackson County, Missouri; (2) waive any and all objections to jurisdiction and venue; and (3) will not raise forum *non conveniens* as an objection to the location of any litigation.

Sec. 6. Compliance with Laws.

Contractor shall comply with all federal, state and local laws, ordinances and regulations applicable to the work and this contract.

Sec. 7. Termination for Convenience.

A. City may, at any time upon ten (10) days notice to Contractor specifying the effective date of termination, terminate this Contract, in whole or in part. If this Contract is terminated by City, City shall be liable only for payment for services rendered before the effective date of termination. Contractor shall prepare an accounting of the services performed and money spent by Contractor up to the effective date of termination and shall return to City any remaining sums within thirty (30) days of such date.

B. If this Contract is terminated prior to Contractor's completion of services, all work or materials prepared or obtained by Contractor pursuant to this contract shall become City's property.

C. If this Contract is terminated prior to Contractor's completion of the services to be performed hereunder, Contractor shall return to City any sums paid in advance by City for services that would otherwise have had to be rendered between the effective date of termination and the original ending date of the Contract. Contractor shall prepare an accounting of the services performed and money spent by Contractor up to the effective date of termination and shall return to City any remaining sums within thirty (30) days of such date.

Sec. 8. Default and Remedies.

If Contractor shall be in default or breach of any provision of this Contract, City may terminate this contract, suspend City's performance, withhold payment or invoke any other legal or equitable remedy after giving Contractor notice and opportunity to correct such default or breach.

Sec. 9. Waiver.

Waiver by City of any term, covenant, or condition hereof shall not operate as a waiver of any subsequent breach of the same or of any other term, covenant or condition. No term, covenant, or condition of this Contract can be waived except by written consent of City, and forbearance or indulgence by City in any regard whatsoever shall not constitute a waiver of same to be performed by Contractor to which the same may apply and, until complete performance by Contractor of the term, covenant or condition, City shall be entitled to invoke any remedy available to it under this Contract or by law despite any such forbearance or indulgence.

Sec. 10. Modification.

Unless stated otherwise in this Contract, no provision of this Contract may be waived, modified or amended except in writing signed by City.

Sec. 11. Headings; Construction of Contract.

The headings of each section of this Contract are for reference only. Unless the context of this Contract clearly requires otherwise, all terms and words used herein, regardless of the number and gender in which used, shall be construed to include any other number, singular or plural, or any other gender, masculine, feminine or neuter, the same as if such words had been fully and properly written in that number or gender.

Sec. 12. Severability of Provisions.

Except as specifically provided in this Contract, all of the provisions of this Contract shall be severable. In the event that any provision of this Contract is found by a court of competent jurisdiction to be unconstitutional or unlawful, the remaining provisions of this Contract shall be valid unless the court finds that the valid provisions of this Contract are so essentially and inseparably connected with and so dependent upon the invalid provision(s) that it cannot be presumed that the parties to this Contract could have included the valid provisions without the invalid provision(s); or unless the court finds that the valid provisions, standing alone, are incapable of being performed in accordance with the intentions of the parties.

Sec. 13. Records.

A. For purposes of this section:

1. "City" shall mean the City Auditor, the City's Internal Auditor, the city's Director of Human Relations, the city Manager, the City department administering this Contract and their delegates and agents.

2. "Record" shall mean any document, book, paper, photograph, map, sound recordings or other material, regardless of physical form or characteristics, made or received in connection with this Contract and all Contract amendments and renewals.

B. Contractor shall maintain and retain all Records for a term of five (5) years that shall begin after the expiration or termination of this Contract and all Contract amendments. City shall have a right to examine or audit all Records and Contractor shall provide access

to City of all Records upon ten (10) days written notice from the City.

C. The books, documents and records of Contractor in connection with this Contract shall be made available to the City Auditor, the City's Internal Auditor, the City's Director of Human Relations and the City department administering this Contract within ten (10) days after the written request is made.

Sec. 14. Affirmative Action.

If this Contract exceeds $300,000.00 and Contractor employs fifty (50) or more people, Contractor shall comply with City's Affirmative Action requirements in accordance with the provisions of Chapter 3 of City's Code, the rules and regulations relating to those sections, and any additions or amendments thereto; in executing any Contract subject to said provisions, Contractor warrants that it has an affirmative action program in place and will maintain the affirmation action program in place for the duration of the Contract. Contractor shall not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin or ancestry, disability, sexual orientation, gender identity or age in a manner prohibited by Chapter 3 of City's Code. Contractor shall:

1. Submit, in print or electronic format, a copy of Contractor's current certificate of compliance to the City's Human Relations Department (HRD) prior to receiving the first payment under the Contract, unless a copy has already been submitted to HRD at any point within the previous two calendar years. If, and only if, Contractor does not possess a current certification of compliance, Contractor shall submit, in print or electronic format, a copy of its affirmative action program to HRD prior to receiving the first payment under the Contract, unless a copy has already been submitted to HRD at any point within the previous two calendar years.

2. Require any Subcontractor awarded a subcontract exceeding $300,000.00 to affirm that Subcontractor has an affirmative action program in place and will maintain the affirmative action program in place for the duration of the subcontract.

3. Obtain from any Subcontractor awarded a subcontract exceeding $300,000.00 a copy of the Subcontractor's current certificate of compliance and tender a copy of the same, in print or electronic format, to HRD within thirty (30) days from the date the subcontract is executed. If, and only if, Subcontractor does not possess a current certificate of compliance, Contractor shall obtain a copy of the Subcontractor's affirmative action program and tender a copy of the same, in print or electronic format, to HRD within thirty (30) days from the date the subcontract is executed.

City has the right to take action as directed by City's Human Relations Department to enforce this provision. If Contractor fails, refuses or neglects to comply with the provisions of Chapter 3 of City's Code, then such failure shall be deemed a total breach of this Contract and this Contract may be terminated, canceled or suspended, in whole or in part, and Contractor may be declared ineligible for any further contracts funded by City for a period of one (1) year. This is a material term of this Contract.

Sec. 15. Tax Compliance.

Contractor shall provide proof of compliance with the City's tax ordinances administered by the City's Commissioner of Revenue as a precondition to the City making the first payment under this contract or any contract renewal when the total contract amount exceeds $160,000.00. If contractor performs work on a contract that is for a term longer than one (1) year, the contractor also shall submit to the City proof of compliance with the City's tax ordinances administered by the City's Commissioner of Revenue as a condition precedent to the City making final payment under the contract.

Sec. 16. Assignability and Subcontracting

(a) Assignability. Contractor shall not assign or transfer any part or all of Contractor's obligation or interest in this Contract without prior written approval of City. If Contractor shall assign or transfer any of its obligations or interests under this Contract without the City's prior written approval, it shall constitute a material breach of this Contract. This provision shall not prohibit contractor from

subcontracting as otherwise provided for herein.

(b) Subcontracting. Contractor shall not subcontract any part or all of Contractor's obligations or interests in this Contract unless the subcontractor has been identified in a format required by City. If Contractor shall subcontract any part of Contractor's obligations or interests under this Contract without having identified the subcontractor, it shall constitute a material breach of this Contract. The utilization of subcontractors shall not relieve Contractor of any of its responsibilities under the Contract, and Contractor shall remain responsible to City for the negligent acts, errors, omissions or neglect of any subcontractor and of such subcontractor's officers, agents and employees. City shall have the right to reject, at any point during the term of this Contract, any subcontractor identified by Contractor, and to require that any subcontractor cease working under this Contract**.** City's right shall be exercisable in its sole and subjective discretion. City shall not be obligated to pay or be liable for payment of any monies which may be due to any subcontractor. Contractor shall include in any subcontract a requirement that the subcontractor comply with all requirements of this Contract in performing Contractor's services hereunder.

Sec. 17. Conflicts of Interest.

Contractor certifies that no officer or employee of City has, or will have, a direct or indirect financial or personal interest in this Contract, and that no officer or employee of City, or member of such officer's or employee's immediate family, either has negotiated, or has or will have an arrangement, concerning employment to perform services on behalf of Contractor in this Contract.

Sec. 18. Buy American Preference.

It is the policy of the City that any manufactured goods or commodities used or supplied in the performance of any City contract or any subcontract thereto shall be manufactured or produced in the United States whenever possible.

Sec. 19. Professional Services – Conflict of Interest Certification.

If this Contract is for professional services other than for medical doctors or appraisers, Contractor certifies that Contractor is not an expert witness for any party in litigation against the City at the time of the issuance of this Contract.

Sec. 20. Attorney Services – Conflict of Interest Certification.

If this Contract is for professional attorney services, Contractor certifies that Contractor and any of its individual attorneys, do not represent any party in litigation against the City at the time of the issuance of this Contract. Contractor's certification shall not apply to: representation in municipal court; attorneys employed by a not-for-profit legal services corporation; litigation where the City is named as a nominal party; litigation that has been filed with the agreement of the City and the party represented by the attorney; or where the City Council has otherwise waived this requirement. Nothing set forth in this section shall be deemed to supersede the Rules of Professional Conduct for Attorneys.

Sec. 21. Employee Eligibility Verification

If this Contract exceeds five thousand dollars($5,000.00), Contractor shall execute and submit an affidavit, in a form prescribed by City, affirming that Contractor does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U. S. C. § 1324a(h)(3). Contractor shall attach to the affidavit documentation sufficient to establish Contractor's enrollment and participation in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986. Contractor may obtain additional information about E-Verify and enroll at www.dhs.gov/xprevprot/programs/gc_1185221678150.shtm. For those Contractors enrolled in E-Verify, the first and last pages of the E-

Verify Memorandum of Understanding that Contractor will obtain upon successfully enrolling in the program shall constitute sufficient documentation for purposes of complying with this Section. Contractor shall submit the affidavit and attachments to the City prior to execution of the Contract, or at any point during the term of the Contract if requested by City.

Sec. 22. Quality Services Assurance Act. If this Contract exceeds $160,000.00, Contractor certifies Contractor will pay all employees who will work on this Contract in the city limits of Kansas City, Missouri at least $12.50 per hour in compliance with the CITY's Quality Services Assurance Act, Section 3-66, Code of Ordinances or City has granted Contractor an exemption.

Sec. 23. Anti-Discrimination Against Israel. If this Contract exceeds $100,000.00 and Contractor employs at least ten employees, pursuant to Section 34.600, RSMo., by executing this Contract, Contractor certifies it is not currently engaged in and shall not, for the duration of this contract, engage in a boycott of goods or services from the State of Israel; companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel; or persons or entities doing business in the State of Israel.

ATTACHMENT A

SCOPE OF SERVICES

EXHIBIT B

SCOPE OF SERVICES

Contractor:	TBD
Owner:	City of Kansas City, Missouri
Project:	Annual Sewer Rehabilitation: Large Diameter City-Wide Sewer Inspections Area 1 or Area 2
Contract No(s):	1633 or 1634
Project No:	60810100

I. GENERAL

The following paragraphs provide a general description of the Work required of this Scope of Services. Subsequent paragraphs describe in detail the services to be provided by CONTRACTOR for completion of sewer inspections in Kansas City, Missouri.

A. The Project. The City of Kansas City (CITY), Missouri, intends to perform sewer inspections in support of various projects located in multiple drainage basins. As such, the CITY is contracting with CONTRACTOR to provide the necessary services.

B. Background Information. The CITY is undertaking this Project to evaluate sewers in support of reducing sewer overflows in the sanitary and combined sewer system by implementing city-wide rehabilitation recommendations to be performed by others. Sewer inspections will be performed to obtain detailed sewer condition assessment data for evaluation and use by others. Data/video processing and quality control and quality assurance shall be conducted by the CONTRACTOR. Specific sewer lines to be inspected by CONTRACTOR will be provided by the CITY. A majority of the sewer inspections will occur in pipe with diameters of 48 inches to 216 inches; however, there will be some sewer inspection of sewer lines between 30 inches and 48-inches in diameter. In addition:

   1. CONTRACTOR shall open manholes lids identified by CITY's SSP Team as "could not open" (CNO).

   2. CONTRACTOR shall locate, expose and verify buried or sunken manholes that could not be located (CNL) by CITY's SSP Team or that are identified by CONTRACTOR's field or CCTV inspection crews.

C. Follow-On Phases. At the discretion of the CITY, the CONTRACTOR may be requested to provide additional services.

D. General Description of Activities. The Basic Scope of Services to be performed by CONTRACTOR consists of furnishing all labor, equipment and materials (as necessary) for sewer line inspection, sewer cleaning, CCTV inspection, locating and opening manholes previously located by CITY's SSP Team.

E. Task Series Listing. The Scope of Services is organized under the following Task Series:

1. Task Series 100 – Project Management and Administration
2. Task Series 200 – Large Diameter Sewer Inspection
3. Task Series 300 – Manhole Location and Opening
4. Task Series 400 – Sewer Cleaning

F. Explicit Responsibilities. The Basic Scope of Services explicitly sets forth what CONTRACTOR shall perform and does not implicitly put any additional responsibilities or duties upon CONTRACTOR. The CONTRACTOR agrees to provide the specific Basic Services as identified herein. CONTRACTOR shall provide unit prices, hourly rates, and a proposed not-to-exceed price for the services and quantities described on the attached **Attachment C.**

G. Out of Scope Services. The CONTRACTOR agrees to provide the specific Basic Services as identified herein; work not specifically discussed herein will not be performed without an amendment or written authorization from the CITY.

H. Detailed Task Descriptions. The CONTRACTOR will provide the following Basic Services for each Task Series as written below. All activities described herein shall be performed in accordance with the *Kansas City, Missouri Smart Sewer Program Sewer Line Inspection Protocol* dated November 2020 (SEWER LINE INSPECTION PROTOCOL). The SEWER LINE INSPECTION PROTOCOL is incorporated into this Contract as **Attachment J**.

II. PROJECT SCHEDULE MILESTONES

A. CONTRACTOR shall complete all Work and all deliverables shall be accepted by CITY for Task Series 100 through 400, no later than 360 calendar days after Notice to Proceed (NTP), with exception of sewer lines that could not be accessed by CONTRACTOR for reasons beyond CONTRACTOR's control as determined by CITY. CONTRACTOR shall maintain a consistent deliverable schedule by providing CITY with approximately 25,000 LF of inspection data every 60 days.

B. CITY will perform quality control reviews within three (3) weeks upon receipt of deliverable and will provide CONTRACTOR with a quality review form (QRF) noting questions, comments, discrepancies, or errors that require CONTRACTOR review and/or correction. CONTRACTOR shall return the corrected deliverable and the QRF with response comments within three (3) weeks upon receipt of the QRF.

III. BASIC SCOPE OF SERVICES

A. The CONTRACTOR will provide the following services for each Task Series as written below.

TASK SERIES 100 - PROJECT MANAGEMENT AND ADMINISTRATION

The purpose of Project Management and Administration will be to manage, direct and oversee each element of Basic Services identified herein and subcontractors employed by the CONTRACTOR in completion of the Work. The following management activities will be provided by CONTRACTOR.

Task 101 Project Management Services

CONTRACTOR will provide project management services necessary for the administration of the Project, including efforts required for proper resource allocation, schedule development and monitoring, budget review and control, client coordination, internal quality assurance/quality control (QA/QC) activities and other standard and customary activities required for timely completion of the Work. CONTRACTOR will prepare and submit invoices in a form that is acceptable to the CITY. CONTRACTOR shall deliver daily notification via e-mail to CITY Project Manager identifying number of crews and approximate working location of each crew for the day.

Task 102 Schedule Development and Monitoring

CONTRACTOR shall submit a proposed project schedule for the CITY's acceptance within ten (10) calendar days after a written Notice to Proceed is issued by the CITY. The proposed project schedule shall include a detailed and comprehensive schedule utilizing a critical path method diagram network that shows start and finish Milestone dates for each deliverable including field work and all other activities necessary to meet the contract completion dates stated in Section II, Paragraph A. After final acceptance of the proposed project schedule by the CITY, it shall be considered the project baseline schedule and shall be used by the CONTRACTOR for planning, scheduling, managing, and executing the Work. The project baseline schedule shall not be changed without the written consent of CITY. CONTRACTOR shall provide, at least once every thirty (30) calendar days, updated information on the project schedule. The updated information on the project schedule shall not modify any Milestone dates in the project schedule that the CITY has previously approved.

Task 103 Monthly Project Progress Status Reports

CONTRACTOR shall prepare and submit to CITY monthly project progress status reports that identify the Work that has been performed in the period, work activities anticipated in the next month, action items required of the CITY for an efficient and effective delivery of CONTRACTOR's services, potential project scope variances with corrective actions suggested by CONTRACTOR, a general assessment of CONTRACTOR's ability to meet project HRD goals and schedule milestones, including identification of any delays beyond its control, and an estimate of the work percent completion for each task series in the Scope of Services based on the value of the work completed.

The monthly project status report shall also include a 'Project Summary Report', 'Cannot Access list with map of proposed clearing requests (if applicable)', and 'Cable Footage Calibration Logs', all in accordance with the SEWER LINE INSPECTION PROTOCOL. In addition, the CONTRACTOR shall provide a monthly project schedule update and a summary table showing; the total length of sewer within each inspection package, the length of sewer that has been inspected, the length of sewer that needs to be inspected, total number of CNL and CNO manholes within each inspection package, number of CNL/CNO manholes completed, number of CNL/CNO manholes to be completed, and percent complete for all quantified work elements.

A short narrative shall be provided describing the work activities performed for each task within a given task series. CITY will provide direction to CONTRACTOR in a timely manner with respect to each potential variance discussed in each monthly project progress status report.

Task 104 Invoicing

CONTRACTOR shall submit invoices for Task Series 200, 300 and 400 at **each inspection package** completion. CONTRACTOR will not be paid until the data has been accepted by CITY in accordance with the CITY's quality control and quality assurance process as described in the SEWER LINE INSPECTION PROTOCOL. CONTRACTOR shall be paid the unit prices and hourly rates listed in **Attachment C**. To be paid the hourly rates CONTRACTOR shall meet or exceed the "Minimum Requirements for Hourly Rates" as detailed in **Attachment C**.

Each invoice submittal will consist of 1) an invoice showing unit rates and quantities for each Task Series with backup documentation as required, 2) a M/WBE utilization report required by the CITY's Human Relations Department (HRD).

Task 105 Monthly Project Coordination Meetings

Participate in up to twelve (12) monthly coordination meetings to discuss submittals, project progress, budget and schedule status, current issues, and potential variances in the scope of work. Anticipated future activities and CITY action items will also be discussed. Prepare and submit an agenda to CITY prior to each meeting and prepare/distribute meeting minutes.

Task 106 Subcontractor Management

CONTRACTOR will manage the efforts of its subcontractors. CONTRACTOR will develop scopes of work for each subcontractor, monitor their progress, review and approve their invoices, oversee adherence to the approved QA/QC plan, monitor adherence to document preparation standards of CONTRACTOR and CITY, and generally oversee each subcontractor's project performance. CITY has established MBE and WBE goals of 6 percent and 14 percent, respectively, for the project. CONTRACTOR will prepare monthly M/WBE subcontractor utilization reports and submit in the required format to the CITY's Human Relations Department.

Task 107 Work Order Management

The CITY shall enter the assets to be inspected for each inspection package into the CITY's web-based work order management application for work order creation prior to the start of inspection work. On a monthly basis, CONTRACTOR shall submit completed work orders for closure approval. If required, CONTRACTOR shall modify work orders and/or enter additional assets within the CITY's web-based work order management application based on assets inspected during that pay cycle. CONTRACTOR shall follow the work tracking application user protocol provided by the CITY.

Payment Considerations:

Separate payment shall not be made for project management and administration but shall be included in the unit prices for which payment is made as detailed in **Attachment C**.

TASK SERIES 200 - LARGE DIAMETER SEWER INSPECTION

The purpose of the sewer inspection is to identify and document all defects and provide an overall condition assessment of the asset. All inspections, defect identification, data collection, reporting,

and storage shall be completed in conformance with the requirements of the SEWER LINE INSPECTION PROTOCOL.

The CONTRACTOR shall be responsible for performing sewer inspections including but not limited to closed-circuit television (CCTV), sound navigation and ranging (SONAR), light amplification by stimulated emission of radiation (LASER), light detection and ranging (LIDAR), Sewer Walk with CCTV and Rebound Hammer Tests.

A detailed summary of sewer line assets to be inspected and recommended inspection technology to be utilized, based on manhole inspections performed by CITY's Smart Sewer Program, will be provided to the CONTRACTOR by the CITY prior to commencing Work. The CITY anticipates providing several packages of approximately 10,000 to 50,000 LF throughout the contract duration until all contract funds are expended. Contractor shall also anticipate special assignments with high priority that may consist of 200 to 10,000 LF.

If the CONTRACTOR determines the CITY's recommended inspection technology is not feasible or not recommended due to actual asset and site conditions, the CONTRACTOR shall recommend a substitute inspection technology for CITY approval.

The CONTRACTOR shall start Work within twenty-one (21) calendar days after a written Notice to Proceed is issued by the CITY. All inspection Work must be completed by the end of the Contract Times as specified in Section II of this Scope of Services regardless of the size, type or condition of the sewer. It is the responsibility of the CONTRACTOR to provide sufficient equipment and workforce to complete the Work within the established Contract Times as defined in Section II of this Scope of Services.

Payment Considerations:

1. Item No. 201 - Full Length CCTV Inspection: The CCTV inspection shall be conducted in a manner that provides an unobstructed view of the pipe above the flowline and the pipe shall be free of debris and obstructions that significantly impede visibility. If these requirements are unable to be met while performing the inspection, CONTRACTOR shall inform CITY of the conditions and the CITY will provide guidance for proceeding. Unit prices shall be paid for CCTV inspection on a per foot basis as listed in **Attachment C**. The basis for payment will be the total pipe length between access points along the existing sewer centerline from access point wall to access point wall as determined by the inspection data.
2. Item No. 202 - Full Length Sewer Walk Inspection: The sewer walk inspection shall be conducted based on observed conditions related to height of the sewer asset and depth of flow described in the SEWER LINE INSPECTION PROTOCOL. If the observed sewer conditions do not meet the requirements described in the SEWER LINE INSPECTION PROTOCOL, CONTRACTOR shall inform CITY of the conditions and the CITY will provide guidance for proceeding. Unit prices shall be paid for sewer walk inspection on a per foot basis as listed in **Attachment C**. The basis for payment will be the total pipe length between access points along the existing sewer centerline from access point wall to access point wall as determined by the inspection data.
3. Item No. 203 - Full Length Multi-Sensor Inspection (HDCCTV, SONAR, and LASER or LIDAR): The multi-sensor inspection shall be conducted in a manner that provides an unobstructed view of the pipe above the flowline. If these requirements are unable to be

met while performing the inspection, CONTRACTOR shall inform CITY of the conditions and the CITY will provide guidance for proceeding. Unit prices shall be paid for a multi-sensor inspection that collects HDCCTV, SONAR, and LASER or LIDAR data, but only processes HDCCTV data, on a per foot basis as listed in **Attachment C**. The basis for payment will be the total pipe length between access points along the existing sewer centerline from access point wall to access point wall as determined by the inspection data.

4. Item No. 204 - Full Length Multi-Sensor Inspection (HDCCTV and SONAR): The multi-sensor inspection shall be conducted in a manner that provides an unobstructed view of the pipe above the flowline. If these requirements are unable to be met while performing the inspection, CONTRACTOR shall inform CITY of the conditions and the CITY will provide guidance for proceeding. Unit prices shall be paid for a multi-sensor inspection that collects HDCCTV and SONAR data, but only processes HDCCTV data, on a per foot basis as listed in **Attachment C**. The basis for payment will be the total pipe length between access points along the existing sewer centerline from access point wall to access point wall as determined by the inspection data.
5. Item No. 205 - Data Processing (SONAR): CONTRACTOR shall not process SONAR inspection data without prior written authorization by CITY. Unit prices shall be paid for multi-sensor inspection data processing of SONAR data, on a per foot basis as listed in **Attachment C**. The basis for payment will be the total pipe length between access points along the existing sewer centerline from access point wall to access point wall as determined by the inspection data.
6. Item No. 206 - Data Processing (LASER or LIDAR): CONTRACTOR shall not process LASER or LIDAR inspection data without prior written authorization by CITY. Unit prices shall be paid for multi-sensor inspection data processing of LASER or LIDAR data, on a per foot basis as listed in **Attachment C**. The basis for payment will be the total pipe length between access points along the existing sewer centerline from access point wall to access point wall as determined by the inspection data.
7. Item No. 207 - Rebound Hammer Test: Rebound Hammer Tests shall be performed at the circumferential pipe location and longitudinal spacing interval as described in the SEWER LINE INSPECTION PROTOCOL. Unit prices shall be paid for on a per each longitudinal testing location basis as listed in **Attachment C**. The basis for payment will be the total number longitudinal testing locations performed as determined by the data deliverables.

Deliverables:

1. Inspection Data: Data deliverables shall be made by inspection package. Inspection packages will contain approximately 25,000 linear feet of sewer assets with varying inspection technology recommendations. CONTRACTOR shall submit data deliverables in accordance with the SEWER LINE INSPECTION PROTOCOL.
2. Project Status Reports: CONTRACTOR shall provide a monthly Project Status Report per the SEWER LINE INSPECTION PROTOCOL.
3. Map Change Forms: CONTRACTOR shall provide Map Change Forms per the SEWER LINE INSPECTION PROTOCOL at the frequency described herein:

a. New Structure: Weekly
b. Change in Structure Type: Weekly
c. Flow Direction: By Inspection Package
d. Does Not Exist (DNE): By Inspection Package
e. Connectivity: By Inspection Package

TASK SERIES 300 - MANHOLE LOCATING AND OPENING

During the course of the performance of manhole inspections by CITY's SSP Team, there will be manholes that cannot be opened or could not be located. CONTRACTOR shall locate and open manholes as they are identified by CITY's SSP Team. "Can Not Locate (CNL)" and a "Can Not Open (CNO)" lists will be developed and provided to the CONTRACTOR at the same time as the Inspection Lists. The CONTRACTOR shall locate and open the listed manholes within the established Contract times as defined in Section II of this Scope of Services. The CONTRACTOR will need to allocate the resources (equipment and manpower) to locate and/or open the identified manholes within the designated time frame as defined in Section II of this Scope of Services. In the course of the sewer inspection work, the CONTRACTOR may find existing manholes below grade that are not on the original list to be located or opened. If this occurs, the CONTRACTOR shall locate the manhole as described in Task Series 300.

MANHOLE LOCATING

The CONTRACTOR shall attempt to locate buried manholes a minimum of thirty (30) minutes per manhole by using metal detectors, GPS equipment with sub-meter accuracy or better, probing rods, locating sondes, CCTV camera, measuring wheels, or other technology as approved by the CITY. Metal detectors shall be capable of locating intermediate sized metal objects at a minimum of three (3) feet depth.

1. Manholes buried below pavement. CONTRACTOR shall locate sewer manholes using metal detectors and CCTV camera with locating sonde and surface measurement verification or other means to be determined by CONTRACTOR and approved by CITY. CONTRACTOR shall verify the manhole location using at least two (2) methods. For example, use of a locating sonde and CCTV length verification from the upstream and/or downstream manhole/s. After locating the manhole, CONTRACTOR shall mark the location on the pavement surface and the adjacent curb with footage offset written on the curb, drive a 2-inch or longer mag nail into the pavement at the manhole location, and then obtain GPS coordinates of sub-meter or better accuracy. CONTRACTOR shall also obtain at least two area photographs from differing vantage points (i.e. facing north and south) documenting the manhole location and the surrounding area. The manhole number and camera direction shall be written on a white board or sign and be legible in the photographs. The photograph shall be taken at a vantage point that allows the marking paint to be visible and at least one identifiable fixed land mark visible in the background or side ground. All photos shall be named with the manhole number, date, and photo number utilizing the following schema: S100-500_20160325_01.
2. Manholes buried less than or equal to 12-inches: CONTRACTOR shall locate manholes buried in unpaved areas using metal detectors, probing rods, shovels, or CCTV camera with locating sonde. After locating the manhole and determining that it is buried less than 12-inches deep,

CONTRACTOR shall unearth the manhole, open it, verify that it is the correct manhole (i.e. not a storm manhole), drive a wood lathe with the manhole number written on it and a 6-inch or longer mag stake on the manhole, and then obtain GPS coordinates of sub-meter for better accuracy. CONTRACTOR shall also obtain at least two area photographs from differing vantage points (i.e. facing north and south) documenting the manhole location and the surrounding area. The manhole number and camera direction shall be written on a white board or sign and be legible in the photographs. The photograph shall be taken at a vantage point that allows the marking paint to be visible and at least one identifiable fixed land mark visible in the background or side ground. All photos shall be named with the manhole number, date, and photo number utilizing the following schema: S100-500_20160325_01. All manholes unearthed in residential areas shall be reburied and surface restored using existing turf salvaged during unearthing.

3. Manholes buried more than 12-inches: CONTRACTOR shall locate manholes buried in unpaved areas using metal detectors, probing rods, shovels, and CCTV camera with locating sonde and surface measurement verification or other means as determined by the CONTRACTOR and approved by CITY. CONTRACTOR shall verify the manhole location using at least two (2) methods. For example, use of a locating sonde and CCTV length verification from the upstream and/or downstream manhole/s. After locating the manhole and determining that it is buried more than 12-inches deep, CONTRACTOR shall verify that it is the correct manhole (i.e. not a storm manhole) using CCTV and locating sonde, drive a wood lathe with the manhole number written on it and a 6-inch or longer mag stake on the manhole, and then obtain GPS coordinates of sub-meter for better accuracy. CONTRACTOR shall also obtain at least two (2) area photographs from differing vantage points (i.e. facing north and south) documenting the manhole location and the surrounding area. The manhole number and camera direction shall be written on a white board or sign and be legible in the photographs. The photograph shall be taken at a vantage point that allows the marking paint to be visible and at least one (1) identifiable fixed landmark visible in the background or side ground. All photos shall be named with the manhole number, date, and photo number utilizing the following schema: S100-500_20160325_01.

   Payment Considerations:

   1. Item No. 301 - Manholes buried below pavement: Locating and verifying manholes buried below pavement shall be paid for on a unit price basis as listed in **Attachment C**.
   2. Item No. 302 - Manholes buried less than 12-inches: Locating and opening manholes buried less than 12-inches deep shall be paid for on a unit price basis as listed in **Attachment C**.
   3. Item No. 303 - Manholes buried more than 12-inches: Locating and verifying manholes buried more than 12-inches deep shall be paid for on a unit price basis as listed in **Attachment C**.
   4. Item No. 304 - Does not exist manhole: If CONTRACTOR determines through CCTV that a manhole does not exist or is abandoned, the CONTRACTOR shall be paid for the partial manhole location effort as listed in **Attachment C**. If the CONTRACTOR is unable to determine through CCTV that a manhole does not exist or is abandoned, the CONTRACTOR will not be paid unless pre-approved by the CITY to perform additional field investigation services to confirm abandoned sewer systems and be paid in accordance with Task Series 300.

Deliverables:

Deliverables shall be made by inspection package, to correspond with the same assets included in the inspection package deliverables in Task Series 200 and, as specified in Section II of this Scope of Services. CONTRACTOR shall submit an excel spreadsheet of the located manholes, containing the XY coordinates based on Missouri State Coordinate System of 1983, West Zone and NAVD88, photo references, buried depth, nearest location address , paved or unpaved, and any significant issues that will affect the CITY's ability to access and/or raise the manhole (i.e. under fence, under shed, 3' tall retaining wall in conflict, under pile of debris in a junk yard, wood fence post in conflict, etc.). Contractor shall also submit photographs in compliance with this Scope of Services.

MANHOLE OPENING

CONTRACTOR shall employ reasonable efforts to open all manholes including use of sledgehammers, pry bars, bond breaking agents, and other equipment.

If a manhole cover is cracked or broken during the opening process, the CONTRACTOR shall attempt to replace the broken cover with a cover provided by the CITY and carried on CONTRACTOR's equipment. Note**,** it is not guaranteed that the CITY will have manhole covers in stock or that the manhole cover will fit the existing frame. If the cover cannot be replaced, CONTRACTOR shall contact the CITY and the CITY will replace the cover. CONTRACTOR shall be responsible for securing the manhole site in unpaved areas and remaining at the manhole location in paved areas until CITY crews arrive or alternatively the CONTRACTOR can secure the site with street closures or street plates in compliance with City of Kansas City Public Works traffic control regulations.

If the bolts are cut, broken or damaged on a bolt down manhole cover during the opening process, the CONTRACTOR shall replace the lid and contact the CITY who will be responsible for replacing and resetting the bolts and replacing any damaged portion of the manhole frame and cover.

Payment Considerations:

1. Item No. 305 - Manhole Opening. CONTRACTOR shall be paid on a unit price basis as listed in **Attachment C** for each manhole requested to be opened by the City and that is opened. No payment shall be made for manholes that are not opened.

Deliverables:

CONTRACTOR shall submit to CITY a listing of manholes that were opened or could not be opened for each inspection package, as specified in Section II of this Scope of Services.

TASK SERIES 400 - SEWER CLEANING

The purpose of the Sewer Line Cleaning is to clean the sewers of debris and any flow obstructions.

Conduct heavy and/or mechanical sewer cleaning as requested by CITY. If CONTRACTOR requires sewer cleaning for passage of inspection equipment, CONTRACTOR shall propose a cleaning method and provide an estimate of time to clear the debris. CITY's representative will review the request and discuss alternatives with the CONTRACTOR or approve the cleaning request. CONTRACTOR shall not proceed with sewer cleaning work without CITY approval. CITY will provide a primary and secondary representative with authority to approve cleaning

requests or adjust inspection technologies/techniques to complete the work. The intent of this contract is to perform sewer inspections without sewer cleaning first.

Upon CITY approval to perform sewer cleaning, CONTRACTOR shall conduct sewer cleaning in conformance with the requirements of the SEWER LINE INPSECTION PROTOCOL and Section 02676 – Sewer Line Cleaning specification incorporated into this Contract as Attachments. CITY shall be notified if the time to remove the debris exceeds 25% of the original estimate at the time of discovery.

The CITY will provide a location at the Buckeye Pump Station for debris disposal at no charge to the CONTRACTOR. CONTRACTOR shall be responsible for transport of debris to the Buckeye Pump Station (5201 NE Birmingham Road). CONTRACTOR shall inform CITY when the container is half full. CONTRACTOR shall not dump debris into either container if it is half full or more. CONTRACTOR shall completely dewater their trucks prior to dumping debris into the CITY's containers. Dewatering is only permitted to an active sanitary or combined sewer and shall occur in method that does not result in waste spillage outside of the sanitary or combined sewer. CONTRACTOR shall not under any circumstance dump liquid into the CITY's containers, street, storm sewers, or storm inlets. If CONTRACTOR fails to comply with the above requirements CONTRACTOR will be required to dispose of debris at another non-CITY facility at the CONTRACTOR'S cost.

CONTRACTOR shall be able to utilize water from the City's potable water system for cleaning operation, but shall be responsible for obtaining a water meter from CITY and shall assume responsibility for required deposit and for payment of the water used. A backflow preventer will be required unless the CONTRACTOR's equipment meets the requirements for Air Gap usage set by the Rules of Department of Natural Resources Division 60 Public Drinking Water Program, Chapter 11- Backflow Prevention 10 CSR 60-11.010:

> "(4) Department-Approved Backflow Prevention Assemblies (B). The discharge pipe of an approved air-gap shall terminate a minimum of two (2) pipe diameters of the discharge pipe above the flood level rim of the receiving vessel: in no case shall the distance be less than one inch (1")"

If a backflow preventer is required, Missouri Department of Natural Resources (MDNR) requires that an inspection of the backflow preventer is required every time it is moved and relocated with the water meter. The CITY's Water Meter Group will complete the backflow preventer inspections, but it may take up to 72 hours after notification for each inspection to occur, so the CONTRACTOR shall plan accordingly in staging their work and obtaining water for cleaning operations. All costs associated with water meter deposit, backflow preventer inspections and staging of work is ancillary to the cleaning and CCTV work and no separate payment will be made.

Payment Considerations for Cleaning in Easements or Rights-of-Way

1. Item No. 401 - Heavy Cleaning: The CONTRACTOR shall be paid the heavy cleaning hourly rates listed in **Attachment C**. Heavy Cleaning hours shall be tracked and invoiced on a **per pipe segment** basis.
2. Item No. 402 - Mechanical Cleaning: The CONTRACTOR shall be paid the mechanical cleaning hourly rates listed in **Attachment C**. Mechanical Cleaning hours shall be tracked and invoiced on a per pipe segment basis.

Deliverables

In accordance with the SEWER LINE INSPECTION PROTOCOL and as required for Task Series 200 Deliverables.

IV. CITY'S RESPONSIBILITIES

CITY will furnish, as required by Basic Services and not at the expense of the CONTRACTOR, the following items:

A. Provide assistance by placing at CONTRACTOR's disposal available information pertinent to the assignment, including GIS data, information for lines to be cleaned and inspected using CCTV, located, or opened and any other data relative thereto.

B. CITY's Project Manager will coordinate meetings between City staff and the CONTRACTOR.

C. Provide location at the Buckeye Pump Station for debris disposal at no cost to CONTRACTOR.

D. Provide "Can Not Locate (CNL)" and "Can Not Open (CNO)" manhole lists developed by CITY's SSP to CONTRACTOR.

E. Conduct backflow prevention inspection within 72 hours of being notified by CONTRACTOR of water meter location used for sewer cleaning.

F. Repair sewer blockages that cannot be removed by CONTRACTOR using cleaning.

G. Replacement of broken manhole covers if CONTRACTOR cannot replace.

H. Replacement and resetting the bolts on bolt down manhole covers.

(End of Scope of Services)

ATTACHMENT B

ELECTRONIC DATA REQUIREMENTS

A. Kansas City Plan Room - Electronic Format Requirements and Naming Conventions

1. In addition to other deliverables included in this Contract, items listed below are requirements to accommodate posting bids documents, plans and specifications on the Kansas City Plan Room.
2. Prime Design Professional/Consultant and Sub-Consultants shall adhere to the following electronic format requirements and use the naming conventions as set out below:
   a. **Drawings/plans**
      (1) Drawings/plans should be rendered as 200-300 dpi **PDF Format** images. No files may be larger than 5 megabytes in size. Plans/Drawings numbering should follow Form 00015 List of Drawings.
      (2) File names may not include any symbols such as **< > : . " / \ | ? ' & # % ^ * ( ) [ ] { } +**
      (3) FILE NAMES: Plans/Drawings numbering should follow Form 00015 List of Drawings. All plans should be named in the following manner: three digit sequential number-brief descriptor. For example: 001-Cover.**pdf** or 002-arc1.**pdf**
   b. **CSI specification sections (project manuals)**
      (1) CSI specification sections should be named by division, using DIV as a prefix. For example:
         (a) DIV01.PDF (Technical, Project Specific)
         (b) DIV02.PDF
         (c) DIV03.PDF
   c. **Summary:**
      (1) Division 00 and 01 in Microsoft Word or Excel
      (2) Division 2-16 in PDF Format
      (3) Completed document originals of Plans and Diagrams of project must be submitted as 200-300 dpi **PDF Format** images.

B. General Requirements

1. Professional Services Consultant/Contractor and its Sub-Consultant/Contractor(s) shall provide at a minimum, the following to its staff:
   a. **Computer**: Minimum Intel Pentium® 4 Processor 2.4 GHz or equivalent processor with 512MB of RAM; recommended Centrino Duo® Processors 1.6 GHz or equivalent with 2GB of RAM, or higher.
   b. **Computer Operation System**: Windows XP, Windows Vista, or Windows 7
   c. **Web Browser**: Microsoft Internet Explorer 9
   d. **Work and Spreadsheet Processors**: Microsoft Office Word, Excel and Outlook
   e. **Scheduling Software**: Microsoft Project or Primavera
   f. **Internet Service Provider**: A reliable ISP in the area of the Project
   g. **Connection Speed/Minimum Bandwidth**: DSL, ADSL or T1 Line for transferring a minimum of **3 Mbps** Downstream **and 512 Kbps** Upstream

C. Contract Information Management System - Project Web Requirements

1. The City will utilize a web based contract information management system/project management tool in the administration of this Contract. This web based application

database is a collaboration tool selected and provided by City, which will allow all project team members continuous access through the Internet to important contract/project data as well as up to the minute decision and approval status information.

2. Design Professional shall provide and shall require its sub-consultants to provide its management personnel assigned to this Contract with access to personal computers and the Internet on a daily basis same.
3. Design Professional shall conduct Project controls, outlined by the City utilizing the web based application database selected and provided by City. **This designated web based application database will be provided by the** Design Professional to its sub-consultants. No additional software will be required. City will assist Design Professional in providing training of sub-Consultant's personnel.
4. Design Professional shall have and shall require its sub-consultants the responsibility for visiting the Project web site on a daily basis, and as necessary to be kept fully appraised of Contract/Project developments, for correspondence, assigned tasks and other matters that transpire on the site.
    a. These may include but are not limited to: Contracts, Contract Exhibits, Contract Amendments, Drawing Issuances, Addenda, Bulletins, Permits, Insurance & Bonds, Safety Program Procedures, Safety Notices, Accident Reports, Personnel Injury Reports, Schedules, Site Logistics, Progress Reports, Daily Logs, Non-Conformance Notices, Quality Control Notices, Punch Lists, Meeting Minutes, Requests for Information, Submittal Packages, Substitution Requests, Monthly Payment Request Applications, Supplemental Instructions, Owner Variation Directives, Potential Variation Orders, Variation Order Requests, Variation Orders, and the like.
    b. All supporting data including but not limited to shop drawings, product data sheets, manufacturer data sheets and instructions, method statements, safety MSDS sheets, Substitution Requests and required documentation will be submitted in digital format via the web based application database selected and provided by City.

D. Electronic File Requirements – Closeout

1. All documents (including as-built drawings) shall be converted or scanned into the Abode Acrobat (.PDF) file format and uploaded to the web based application database selected and provided by City.
2. In addition to the standard closeout submittal requirements detailed elsewhere in the Contract Documents, the Prime Design Professional/Consultant and Sub-Consultants shall also submit all closeout documents including but not limited to all "As-Built Drawings", catalog cuts and Owner's Operation and Maintenance manuals in digital format.

E. Project Management Communications - Construction

1. The Contractor shall use the Internet web based contract information management system/project management communications tool selected and provided by City, and protocols included in that software during the term of this Contract. The use of project management communications as herein described does not replace or change any contractual responsibilities of the participants.
2. The project communications database is on-line and fully functional. User registration, electronic and computer equipment, and Internet connections are the responsibility of each project participant. The sharing of user accounts is prohibited.

3. Training: City's software service provider will provide a group training sessions scheduled by City, the cost of which is included in the initial users fee. Users are required to attend the scheduled training sessions they are assigned. Requests for specific scheduled classes will be on a first come first served basis for available spaces. Companies may also obtain group training from City's software service provider at their own expense
4. Support: City's software service provider will provide on-going support through on-line help files.
5. Project Archive: The archive shall be available to each team member at a nominal cost. The archive set will contain only documents that the firm has security access to during construction. All legal rights in any discovery process are retained. Archive material shall be ordered from City's software service provider.
6. Copyrights and Ownership: Nothing in this specification or the subsequent communications supersedes the parties' obligations and rights for copyright or document ownership as established by the Contract Documents. The use of CAD files, processes or design information distributed in this system is intended only for the project specified herein.
7. Purpose: The intent of using a project management communication tool is to improve project work efforts by promoting timely initial communications and responses. Secondly, to reduce the number of paper documents while providing improved record keeping by creation of electronic document files.
8. Authorized Users: Access to the web site will be by individuals who are licensed users.
    a. Individuals may use the User Application included in these specifications or may request the User Application.
    b. Authorized users will be contacted directly by the web site provider, who will assign the temporary user password.
    c. Individuals shall be responsible for the proper use of their passwords and access to data as agents of the company in which they are employed.
9. Administrative Users: Administrative users have access and control of user licenses and all posted items. **DO NOT POST PRIVATE OR YOUR COMPANY CONFIDENTIAL ITEMS IN THE DATABASE!** Improper or abusive language toward any party or repeated posting of items intended to deceive or disrupt the work of the project will not be tolerated and will result in deletion of the offensive items and revocation of user license at the sole discretion of the Administrative User(s).

ATTACHMENT C

UNIT COSTS

Proposer: Ace Pipe Cleaning Inc.

EXHIBIT C - UNIT PRICES

Project No. 60810100, Contract No. 1633 or 1634

Project Title. Annual Sewer Rehabilitation: Large Diameter City-Wide Sewer Inspection Area 1 or 2

Item No.	Item Description:	Units	Quantity	Rate	Total	Minimum Requirements for Unit Rates
Task Series 200	**Large Diameter Sewer Inspections**					
201	Full Length CCTV Inspection for Sewer Sizes 30-in to 216-in	Linear Feet	60,000	$ 2.25	**$ 135,000.00**	
202	Full Length Sewer Walk Inspection for Sewer Sizes 72-in to 216-in	Linear Feet	5,000	$ 13.75	**$ 68,750.00**	Includes CCTV
203	Full Length Multi-Sensor Inspection: HDCCTV, SONAR, and LASER or LIDAR for Sewer Sizes 30-in to 216-in	Linear Feet	30,000	$ 3.00	**$ 90,000.00**	
204	Full Length Multi-Sensor Inspection: HDCCTV and SONAR for Sewer Sizes 30-in to 216-in	Linear Feet	5,000	$ 2.75	**$ 13,750.00**	
205	Data Processing: SONAR	Linear Feet	35,000	$ 2.00	**$ 70,000.00**	
206	Data Processing: LASER or LIDAR	Linear Feet	30,000	$ 2.50	**$ 75,000.00**	
207	Rebound Hammer Test	Each	75	$ 600.00	**$ 45,000.00**	Perform 3 tests in accordance with the Sewer Line Inspection Protocol (3 O'clock, 9 O'clock, and 12 O'clock) per longitudinal testing location.
Task Series 300	**Manhole Opening and Locating**					
301	Manhole Locate Buried Below Pavement	Each	10	$ 400.00	**$ 4,000.00**	NA
302	Manhole Locate Buried Less Than or Equal to 12"	Each	35	$ 500.00	**$ 17,500.00**	NA
303	Manhole Locate Buried Greater Than 12"	Each	10	$ 600.00	**$ 6,000.00**	NA
304	Does Not Exist Manhole	Each	15	$ 150.00	**$ 2,250.00**	NA
305	Manhole Opening	Each	20	$ 250.00	**$ 5,000.00**	NA
Task Series 400	**Sewer Cleaning**					
401	Heavy Cleaning	Hour	150	$ 240.00	**$ 36,000.00**	One cleaning truck, one operator, and one laborer
402	Mechanical Cleaning	Hour	100	$ 500.00	**$ 50,000.00**	One cleaning truck, two bucket machines, three operators, and one laborer
	Allowance Authorization				**$ 131,750.00**	To complete additional assigned work as needed
				TOTAL=	**$ 750,000.00**	Mathematical errors will be corrected at the City's discretion for the purposes of proposal evaluation.

Ace Pipe Cleaning Inc.
6601 Universal Ave.
Kansas City, MO 64120

Theresa Calvert, Vice President

ATTACHMENT D

CITY – LICENSED GEOGRAPHICAL INFORMATION SYSTEM DATA

CITY will provide licensed materials for Geographical Information Systems to be used for the project as follows:

Grant of License. CITY grants to DESIGN PROFESSIONAL and DESIGN PROFESSIONAL hereby accepts, upon the express terms and conditions contained in this Agreement, a non-exclusive License to use the information described herein in the form produced and maintained by the Geographical Information System produced and maintained by City.

License Materials. The materials licensed for use by DESIGN PROFESSIONAL under this Agreement are the forms which can be read or manipulated by computer of the geographical and physical characteristic information collected and assimilated in the records of City ("Licensed Materials").

Use of Licensed Materials. Subject to the terms, conditions and prohibitions of this Agreement, DESIGN PROFESSIONAL shall be entitled to use the information contained in the Licensed Materials to accomplish the scope of services provided by DESIGN PROFESSIONAL. At the completion of the Agreement, DESIGN PROFESSIONAL shall return all materials to the CITY, and shall permanently remove the Licensed Materials from any media used by DESIGN PROFESSIONAL. At the end of the Agreement, DESIGN PROFESSIONAL shall provide a written certification that all materials are returned and that all Licensed Materials, including copies, have been removed from the equipment or media of DESIGN PROFESSIONAL.

Transfer of Licensed Materials. This license is expressly nontransferable and DESIGN PROFESSIONAL shall not transfer any interest, entitlement or obligation under this Agreement to any other person or entity.

Data. The data and information contained in the Licensed Materials shall be those files and systems as recorded and existing as of the time DESIGN PROFESSIONAL requests the information.

Title. The custody and title and all other rights and interests in the Licensed Materials are and shall at all times remain with the CITY and with the Offices or officials of the CITY having official custody of the Licensed Materials.

Not Public Records. The database in the form of the Licensed Materials is proprietary, intellectual property of the CITY and shall not be considered or deemed as open, public records, except as provided in §256.670, RSMo. DESIGN PROFESSIONAL shall and hereby expressly agrees that it will, recognize the property interests of CITY and CITY agrees that it is not,

pursuant to this License, a custodian of any open, public records, except as may exist pursuant to §256.670 RSMo.

Access to Materials. Pursuant to the terms and conditions of this agreement, DESIGN PROFESSIONAL shall be provided access to obtain the Licensed Materials in a periodic basis for the term of this Agreement. As provided in this Agreement, DESIGN PROFESSIONAL, shall be entitled to any Modifications, updates, renewals or additional data or information under the License granted by this Agreement.

Updated Material and Modifications. CITY shall in accordance with this Agreement and upon request of the DESIGN PROFESSIONAL provide to DESIGN PROFESSIONAL updates to or modifications of all or any specific parts of the data or information in the Licensed Materials. Any such updates or modifications provided by CITY shall be covered by and subject to each and all of the terms and conditions of this Agreement. Furthermore, upon completion or termination of this Agreement, DESIGN PROFESSIONAL, will provide to CITY in a compatible form, updated information developed during the execution of the Scope of Services provided by DESIGN PROFESSIONAL.

Data Contents. The data contained in the materials licensed by CITY to DESIGN PROFESSIONAL under this Agreement shall include that information necessary to allow DESIGN PROFESSIONAL to perform scope of services outlined in the Agreement.

Waiver. The waiver of any breach of any provision of this license shall not constitute a waiver of any subsequent breach of the same or other provisions of the Agreement.

Modifications. Any modification to the rights provided herein for licensed materials shall be in writing executed by each party.

ATTACHMENT E

HRD DOCUMENTS

1. 00450 HRD Form 08: Contractor Utilization Plan & Request for Waiver
2. 00450.01: HRD Letter of Intent to Subcontract
3. 00460 HRD Form 10: Timetable for MBE/WBE Utilization
4. 00470 HRD Form 11: Request for Modification or Substitution
5. 01290.14: Contractor Affidavit for Final Payment
6. 01290.15: Subcontractor Affidavit for Final Payment

CONTRACTOR UTILIZATION PLAN/REQUEST FOR WAIVER

Project Number _____

Project Title _____

_____ _____
(Department Project) Department

_____
(Bidder/Proposer)

STATE OF _____)
) ss
COUNTY OF _____)

I, _____, of lawful age and upon my oath state as follows:

1. This Affidavit is made for the purpose of complying with the provisions of the MBE/WBE submittal requirements on the above project and the MBE/WBE Program and is given on behalf of the Bidder/Proposer listed below. It sets out the Bidder/Proposer's plan to utilize MBE and/or WBE contractors on the project.

2. The project goals are _____ **% MBE** and _____ **% WBE.** Bidder/Proposer assures that it will utilize a minimum of the following percentages of MBE/WBE participation in the above project:

BIDDER/PROPOSER PARTICIPATION:_____% MBE _____% WBE

3. The following are the M/WBE subcontractors whose utilization Bidder/Proposer warrants will meet or exceed the above-listed Bidder/Proposer Participation. Bidder/Proposer warrants that it will utilize the M/WBE subcontractors to provide the goods/services described in the applicable Letter(s) of Intent to Subcontract, copies of which shall collectively be deemed incorporated herein). ***(All firms must currently be certified by Kansas City, Missouri)***

   a. Name of M/WBE Firm _____
   Address _____
   Telephone No. _____
   I.R.S. No. _____

   b. Name of M/WBE Firm _____
   Address _____

Telephone No. _____
I.R.S. No. _____

c. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

d. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

e. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

f. Name of M/WBE Firm _____
Address _____
Telephone No. _____
I.R.S. No. _____

(List additional M/WBEs, if any, on additional page and attach to this form)

4. The following is a breakdown of the percentage of the total contract amount that Bidder/Proposer agrees to pay to each listed M/WBE:

MBE/WBE BREAKDOWN SHEET

MBE FIRMS:

Name of MBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract

TOTAL MBE $ / TOTAL MBE %: $_____ _____%

WBE FIRMS:

Name of WBE Firm	Supplier/Broker/Contractor	Subcontract Amount*	Weighted Value**	% of Total Contract
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
TOTAL WBE $ / TOTAL WBE %:		$_____		_____%

*"Subcontract Amount" refers to the dollar amount that Bidder/Proposer has agreed to pay each M/WBE subcontractor as of the date of contracting and is indicated here solely for the purpose of calculating the percentage that this sum represents in proportion to the total contract amount. Any contract amendments and/or change orders changing the total contract amount may alter the amount due an M/WBE under their subcontract for purposes of meeting or exceeding the Bidder/Proposer participation.

**"Weighted Value" means the portion of the subcontract amount that will be credited towards meeting the Bidder/Proposer participation. See HRD Forms and Instructions for allowable credit and special instructions for suppliers.

5. Bidder/Proposer acknowledges that the monetary amount to be paid each listed M/WBE for their work, and which is approved herein, is an amount corresponding to the percentage of the total contract amount allocable to each listed M/WBE as calculated in the MBE/WBE Breakdown Sheet. Bidder/Proposer further acknowledges that this amount may be higher than the subcontract amount listed therein as change orders and/or amendments changing the total contract amount may correspondingly increase the amount of compensation due an M/WBE for purposes of meeting or exceeding the Bidder/Proposer participation

6. Bidder/Proposer acknowledges that it is responsible for considering the effect that any change orders and/or amendments changing the total contract amount may have on its ability to meet or exceed the Bidder/Proposer participation. Bidder/Proposer further acknowledges that it is responsible for submitting a Request for Modification or Substitution if it will be unable to meet or exceed the Bidder/Proposer participation set forth herein.

7. If Bidder/Proposer has not achieved both the M/WBE goal(s) set for this Project, Bidder/Proposer hereby requests a waiver of the MBE and/or WBE goal(s) that Bidder/Proposer has failed to achieve

8. Bidder/Proposer will present documentation of its good faith efforts, a narrative summary detailing its efforts and the reasons its efforts were unsuccessful when requested by the City.

9. I hereby certify that I am authorized to make this Affidavit on behalf of the Bidder/Proposer named below and who shall abide by the terms set forth herein:

Bidder/Proposer primary contact: _____
Address: _____
_____
Phone Number: _____
Facsimile number: _____
E-mail Address: _____

By: _____
Title: _____
Date: _____
(Attach corporate seal if applicable)

Subscribed and sworn to before me this _____ day of _____, 20__.

My Commission Expires: _____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

LETTER OF INTENT TO SUBCONTRACT

Check one:

Original LOI: ☐

Updated LOI: ☐

Project Name/Title _____

Project Location/Number _____

PART I: Prime Contractor_____ agrees to enter into a contractual agreement with M/W/DBE/Section 3 Subcontractor _____ who will provide the following goods/services in connection with the above-reference contract: [Insert a brief narrative describing goods/services to be provided. Broad Categorizations (e.g., "electrical," "plumbing," etc.) or the listing of NAICS Codes in which M/W/DBE Subcontractor is certified are insufficient and may result in denial of this Letter of Intent to Subcontract.]

_____

_____

_____

for an estimated amount of $_____ (or _____% of the total estimated contract value.)

M/WBE Vendor type:

☐ Subcontractor/manufacturer (counts as 100% of contract value towards goals)

☐ Supplier (counts as 60% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

☐ Broker (counts as 10% of the total dollar amount paid or to be paid by a prime contractor for supplies or goods towards goals)

M/W/DBE/Section 3 Subcontractor is, to the best of Prime Contractor's knowledge, currently certified with the City of Kansas City's Human Relations Department to perform in the capacities indicated herein. Prime Contractor agrees to utilize M/W/DBE Subcontractor in the capacities indicated herein, and M/W/DBE Subcontractor agrees to work on the above-referenced contract in the capacities indicated herein, contingent upon award of the contract to Prime Contractor.

PART 2: This section is to be completed by the M/W/DBE subcontractor listed above. Please attach additional sheets as needed for more than one intended sub-tier contract. **IMPORTANT: Falsification of this document will result in denial and other remedies available under City Code.**

Select one:

☐ The M/W/DBE Subcontractor listed above **IS NOT** subcontracting any portions of the above-stated scope of work(s). (Continue to Part 3.)

☐ The M/W/DBE Subcontractor listed above **IS** subcontracting certain portions of the above stated scope of work(s) to:

(1) Company name: _____

Full address: _____
Street number and name City, State and Zip Code

Primary contact: _____
Name Phone

a) This subcontractor is (circle one): MBE WBE DBE N/A

i: If this subcontractor is an M/W/DBE certified with the City of Kansas City, Missouri, a separate Letter of Intent must be attached to this document.

ii. If this subcontractor is NOT a certified M/W/DBE certified with the City of Kansas City, Missouri, the firm must still be listed for reporting purposes but a Letter of Intent is not required.

b) Scope of work to be performed: _____

c) The dollar value of this agreement is: _____

PART 3:

NOTE: SIGNATURES AND NOTARIZATIONS REQUIRED FOR NEW LETTERS OF INTENT (LOI); <u>SIGNATURES ONLY</u> FOR UPDATED LOI (ADDING VALUE TO EXISTING CONTRACT).

PRIME CONTRACTOR BUSINESS NAME: _____

_____ _____
Signature: Prime Contractor Print Name

_____ _____
Title Date

State of)

County of)

I, _____, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this day of _____ , 20____

My Commission Expires: _____ _____
Notary Public

STAMP:

MWDBE SUBCONTRACTOR BUSINESS NAME: _____

_____ _____
Signature: Prime Contractor Print Name

_____ _____
Title Date

State of)

County of)

I, _____, state that the above and foregoing is based on my best knowledge and belief.

Subscribed and sworn to before me, a notary public, on this day of _____ , 20____

My Commission Expires: _____ _____
Notary Public

STAMP:

TIMETABLE FOR MBE/WBE UTILIZATION

(This form should be submitted to the City after contract award.)

I, _____, acting in my capacity as _____
(Name) *(Position with Firm)*
of _____, with the submittal of this Timetable, certify that
(Name of Firm)
the following timetable for MBE/WBE utilization in the fulfillment of this contract is correct and true to the best of my knowledge.

ALLOTTED TIME FOR THE COMPLETION OF THIS CONTRACT
(Check one only)

15 days	___	75 days	___	135 days	___
30 days	___	90 days	___	150 days	___
45 days	___	105 days	___	165 days	___
60 days	___	120 days	___	180 days	___

Other _____ (Specify)

Throughout _____ Beginning 1/3 _____
Middle 1/3 _____ Final 1/3 _____
Beginning 1/3 _____% Middle 1/3 _____% Final 1/3 _____%

PLEASE NOTE: Any changes in this timetable require approval of the Human Relations Department in advance of the change.

If you have any questions regarding the completion of this form, please contact the Department of Human Relations at: (816) 513-1818**.**

_____
(Signature)

_____
(Position with Firm)

_____
(Date)

REQUEST FOR MODIFICATION OR SUBSTITUTION

*(This Form **must** be submitted to HRD to request substitutions for an MBE/WBE listed in the Contractor Utilization Plan or for modification of the amount of MBE/WBE participation listed in the Contractor Utilization Plan. This Form shall be an amendment to the Contractor Utilization Plan.)*

BIDDER/PROPOSER/CONTRACTOR: _____
ADDRESS: _____
PROJECT NUMBER OR TITLE: _____
AMENDMENT/CHANGE ORDER NO: (if applicable) _____

Project Goals:	_____% MBE	_____% WBE
Contractor Utilization Plan:	_____% MBE	_____% WBE

1. I am the duly authorized representative of the above Bidder/Contractor/Proposer and am authorized to request this substitution or modification on behalf of the Bidder/Contractor/Proposer.

2. I hereby request that the Director of HRD recommend or approve: (check appropriate space(s))

   a. ____ A substitution of the certified MBE/WBE firm _____,
   (Name of new firm)
   to perform _____,
   (Scope of work to be performed by new firm)
   for the MBE/WBE firm _____ which is currently
   (Name of old firm)
   listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan to
   perform the following scope of work: _____.
   (Scope of work of old firm)

   b. ____A modification of the amount of MBE/WBE participation currently listed on the Bidder's/Contractor's/Proposer's Contractor Utilization Plan from

      _____ % MBE_____% WBE *(Fill in % of MBE/WBE Participation currently listed on Contractor Utilization Plan)*

      TO

      _____% MBE _____% WBE *(Fill in New % of MBE/WBE Participation requested for Contractor Utilization Plan)*

   c. Attach 00450.01 Letter of Intent to Subcontract letter for each new MBE/WBE to be added.
   d. Attach a copy of the most recent 00485.01 or on-line M/WBE Monthly Utilization Report

3. Bidder/Contractor/Proposer states that a substitution or modification is necessary because: (check applicable reason(s))

___The MBE/WBE listed on the Contractor Utilization Plan is non-responsive or cannot perform.

___The MBE/WBE listed on the Contractor Utilization Plan has increased its previously quoted price without a corresponding change in the scope of work.

___The MBE/WBE listed on the Contractor Utilization Plan has committed a material default or breach of its contract.

___Requirements of the scope of work of the contract have changed and make subcontracting not feasible or not feasible at the levels required by the goals established for the contract.

___The MBE/WBE listed on the Contractor Utilization Plan is unacceptable to the City contracting department.

___Bidder/Contractor/Proposer has not attempted intentionally to evade the requirements of the Act and it is in the best interests of the City to allow a modification or substitution.

4. The following is a narrative summary of the Bidder's/Contractor's/Proposer's good faith efforts exhausted in attempts to substitute the MBE/WBE firm named above which is currently listed on the Contractor Utilization Plan with other qualified, certified MBE/WBE firms for the listed scope of work or any other scope of work in the project:

_____
_____
_____
_____
_____
_____
_____
_____
_____

5. Bidder/Proposer/Contractor will present documentation when requested by the City to evidence its good faith efforts.

Dated:_____ _____

(Bidder/Proposer/Contractor) **"Company Name"**

_____

By: (Authorized Representative) "**signature"**

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

CONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number _____

Project Title _____

STATE OF _____)
)SS
COUNTY OF _____)

The Undersigned, _____ of lawful
(Name)
age, being first duly sworn, states under oath as follows:

1. I am the _____ of _____who is the general
(Title) (CONTRACTOR)
CONTRACTOR for the CITY on Project No. _____ and Project Title _____.

2. All payrolls, material bills, use of equipment and other indebtedness connected with the Work for this Project have been paid and all Claims of whatever nature have been satisfied, as required by the Contract.

3 (✓) ____Prevailing wage does not apply; or

(✓) ____All provisions and requirements set forth in Chapter 290, Section 290.210 through and including 290.340, Missouri Revised Statutes, pertaining to the payment of wages to workmen employed on public works projects have been fully satisfied and there has been no exception to the full and complete compliance with these provisions and requirements and the Annual Wage Order contained in the Contract in carrying out the Contract and Work. CONTRACTOR has fully complied with the requirements of the prevailing wage law as required in the Contract and has attached affidavits from all Subcontractors on this Project, regardless of tier, affirming compliance with the prevailing wage law as stipulated in the Contract.

4. I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved (_____%) Minority Business Enterprise (MBE) participation and (_____%) Women Business Enterprise (WBE) participation on this contract, and (b) listed herein are the names of all certified M/WBE subcontractors, regardless of tier, with whom I, or my subcontractors contracted.

1. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work _____
Subcontract Final Amount _____

2. Name of MBE/WBE Firm _____
Address _____
_____
Telephone Number (_____) _____
IRS Number _____
Area/Scope*of Work_____
Subcontract Final Amount _____

List additional subcontractors, if any, on a similar form and attach to the bid.

Supplier** Final Amount: _____

*Reference to specification sections or bid item number.

(✓) ____ Met or exceeded the Contract utilization goals; or
(✓) ____ Failed to meet the Contract utilization goals (attach waiver, substitution or modification); or
(✓) ____ No goals applied to this Project.

5. CONTRACTOR certifies that each Subcontractor has received full payment for its respective work in connection with the Contract.

6. If applicable, I hereby certify that (a) at project completion and pursuant to contractor's final request for payment, contractor achieved, company-wide, at least ten percent (10%) minority workforce participation and two percent (2%) women workforce participation and (2) a true and accurate copy of my final project workforce monthly report (HRD Form 00485.02 and final company-wide workforce monthly report (HRD Form 00485.03) are attached. **NOTE: This paragraph is only applicable if you completed a construction contract that was estimated by the City, prior to solicitation, as requiring more than 800 construction labor hours and costing in excess of $324,000.01. If applicable you MUST attach copies of your final monthly workforce reports.**

7. This affidavit is made in behalf of the CONTRACTOR for the purpose of securing from Kansas City, Missouri, the certification of completion of the Project and receiving payment therefore.

8. If the Contract amount exceeded $150,000, CONTRACTOR has submitted proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue and has on file proof of tax compliance from all Subcontractors. If the Contract term exceeded one (1) year, CONTRACTOR has provided proof of compliance with the City tax ordinances administered by the City's Commissioner of Revenue prior to receiving final payment and has on file proof of tax compliance from all Subcontractors prior to the Subcontractor receiving final payment from CONTRACTOR.

CONTRACTOR_____

By _____
(Authorized Signature)

Title _____

On this _____ day of _____, _____, before me

appeared _____, to me personally known to be the

_____of the_____,

and who executed the foregoing instrument and acknowledged that (s)he executed the same on behalf of

_____ as its free act and deed.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal on the day and year first above written.

My commission expires:

_____ _____
Notary Public

CITY OF FOUNTAINS
HEART OF THE NATION
KANSAS CITY
MISSOURI

SUBCONTRACTOR AFFIDAVIT FOR FINAL PAYMENT

Project Number _____

Project Title _____

STATE OF MISSOURI)

) ss:

COUNTY OF _____)

After being duly sworn the person whose name and signature appears below hereby states under penalty of perjury that:

1. I am the duly authorized officer of the business indicated below (hereinafter Subcontractor) and I make this affidavit on behalf of Subcontractor in accordance with the requirements set forth in Section 290.290, RSMo. Subcontractor has completed all of the Work required under the terms and conditions of a subcontract as follows:

Subcontract with: _____, Contractor

Work Performed: _____

Total Dollar Amount of Subcontract and all Change Orders: $_____

City Certified ☐MBE ☐ WBE ☐ DBE ☐ NA
List certifications: _____

2. Subcontractor fully complied with the provisions and requirements of the Missouri Prevailing Wage Law set forth in Sections 290.210, RSMo through 290.340, RSMo.

Business Entity Type:
(___) Missouri Corporation
(___) Foreign Corporation
(___) Fictitious Name Corporation
(___) Sole Proprietor
(___) Limited Liability Company
(___) Partnership
(___) Joint Venture
(___) Other (Specify)

Subcontractor's Legal Name and Address

_____

_____
Phone No. _____
Fax: _____
E:mail:_____
Federal ID No._____

I hereby certify that I have the authority to execute this affidavit on behalf of Subcontractor.

By: _____ _____
(Signature) (Print Name)

_____ _____
(Title) (Date)

NOTARY

Subscribed and sworn to before me this _____ day of _____, 20_____.

My Commission Expires:_____ By_____

_____ _____
Print Name Title

CITY OF FOUNTAINS
HEART OF THE NATION

KANSAS CITY
MISSOURI

Attachment F

PERFORMANCE BOND

Project Number _____

Project Title _____

KNOW ALL MEN BY THESE PRESENTS: That _____, as PRINCIPAL (CONTRACTOR), and _____, (SURETY), licensed to do business as such in the State of Missouri, hereby bind themselves and their respective heirs, executors, administrators, successors, and assigns unto Kansas City, Missouri, a constitutionally chartered municipal corporation, (OWNER), as obligee, in the penal sum of _____ Dollars ($ _____) for the payment whereof CONTRACTOR and SURETY bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into a Contract with OWNER for_____ which Contract, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform said Contract including all duly authorized changes thereto, according to all the terms thereof, including those under which CONTRACTOR agrees to pay legally required wage rates including the prevailing hourly rate of wages in the locality, as determined by the Department of Labor and Industrial Relations or by final judicial determination, for each craft or type of workman required to execute the Contract and, further, shall defend, indemnify, and hold harmless OWNER from all damages, including but not limited to liquidated damages, loss and expense occasioned by any failure whatsoever of said CONTRACTOR and SURETY to fully comply with and carry out each and every requirement of the Contract, then this obligation shall be void; otherwise, it shall remain in full force and effect.

WAIVER. That SURETY, for value received, hereby expressly agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work to be performed thereunder, shall in any way affect the obligations of this Bond; and it does hereby waive notice of any such change, extension of time, or alteration or addition to the terms of the Contract or the Work to be performed thereunder.

IN WITNESS WHEREOF, the above parties have executed this instrument the ____ day of _____, 20_____.

CONTRACTOR
Name, address and facsimile number of Contractor

_____
_____
_____
_____

I hereby certify that I have authority to execute
this document on behalf of Contractor.

By: _____
Title:_____

(Attach corporate seal if applicable)

SURETY
Name, address and facsimile number of Surety:

_____
_____
_____
_____

I hereby certify that (1) I have authority to execute this document on behalf of Surety; (2) Surety has an A.M. Best rating of A- or better; (3) Surety is named in the current list of "Companies Holding Certificates of Authority as Acceptable Reinsuring Companies: as published in Circular 570 (most current revision) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury; and (4) Surety is duly licensed to issue bonds in the State of Missouri and in the jurisdiction in which the Project is located.

By:_____
Title:_____
Date:_____

(Attach seal and Power of Attorney)

ATTACHMENT G

EMPLOYEE ELIGIBILITY VERIFICATION AFFIDAVIT

(Required for any contract with the City of Kansas City, Missouri in excess of $5,000.00)

STATE OF _____)
) ss
COUNTY OF _____)

On this _____ day of _____, 20___, before me appeared _____, personally known by me or otherwise proven to be the person whose name is subscribed on this affidavit and who, being duly sworn, stated as follows:

I am of sound mind, capable of making this affidavit, and personally swear or affirm that the statements made herein are truthful to the best of my knowledge. I am the _____ (title) of _____ (business entity) and I am duly authorized, directed or empowered to act with full authority on behalf of the business entity in making this affidavit.

I hereby swear or affirm that the business entity does not knowingly employ any person in connection with the contracted services who does not have the legal right or authorization under federal law to work in the United States as defined in 8 U.S.C. § 1324a(h)(3).

I hereby additionally swear or affirm that the business entity is enrolled in an electronic verification of work program operated by the United States Department of Homeland Security (E-Verify) or an equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, under the Immigration Reform and Control Act of 1986, and that the business entity will participate in said program with respect to any person hired by the business entity to perform any work in connection with the contracted services. I have attached hereto documentation sufficient to

establish the business entity's enrollment and participation in the required electronic verification of work program.

I am aware and recognize that unless certain contractual requirements are satisfied and affidavits obtained as provided in Section 285.530, RSMo, the business entity may face liability for violations committed by its subcontractors, notwithstanding the fact that the business entity may itself be compliant.

I acknowledge that I am signing this affidavit as the free act and deed of the business entity and that I am not doing so under duress.

_____

Affiant's signature

Subscribed and sworn to before me this _____ day of _____, 20____.

_____

Notary Public

My Commission expires:

ATTACHMENT H

Non-Construction Subcontractors Listing

Contractor shall submit Subcontractor information on this form prior to Subcontractor beginning Work. Contractor shall update this listing and keep it current for the life of the Contract.

	Company Name Contact Name and Email	Address Phone No. and Fax No.
1.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
2.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
3.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
4.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
5.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
6.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
7.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
8.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
9.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____
10.	Name:_____ Email:	Address:_____ _____ Phone:_____ Fax:_____

Contractor – Company Name: _____
Submitted By: _____
Title: _____
Telephone No.: _____
Fax No.: _____
E-mail: _____
Date: _____

ATTACHMENT I

NON-CONSTRUCTION APPLICATION FOR PAYMENT

NON-CONSTRUCTION
APPLICATION FOR PAYMENT

Project Number _____

Contract Number _____

Project Title _____

Final Payment ☐

Application Number: _____ Date:_____

Ordinance Number: _____ Ordinance Date:_____

City PO Number: _____

Design Professional/Contractor:

Legal Name _____

Mail Address: _____

City, ST Zip _____

Vendor Number _____

Application for Work Accomplished: From _____ To: _____

Name of Kansas City, MO Project Mgr: _____

Kansas City, MO Contract Administrator: _____

Original Contract Amount	[1]	$0.00		
Net by Amendments ___ through ___	[2]	$0.00		
Optional Services Amount in Contract	[3]	$0.00		
Net by Optional Services Authorizations ___ through ___	[4]	$0.00		
Unathorized Optional Services Amount Remaining (3-4)	[5]	$0.00		
Maximum Obligation Authorized ([1+2+4] - [3])			[6]	$0.00
Total Work Completed to Date			[7]	$0.00
Total Previous Payments			[8]	$0.00
PAYMENT DUE CONTRACTOR (7-8)			[9]	$0.00

Instructions to Design Professional/Contractor:

1. Complete and sign this Application and attach the following items: A) **documentation** of expenses (direct payroll, direct expenses, and sub-consultants) per contract (ie.services performed; actual salary of personnel for time charges directly to the project; and/or actual reasonable expenses incurred, AND, B) a photocopy of your most recent **00485.01 HRD MWBE Monthly Utilization Report** submitted to Human Relations Dept., if required by contract, AND C) Monthly Progress Report, if required by contract.
2. If this is the First application for payment and if Contract amount exceeds $150,000.00, then also attach proof of tax compliance (**Revenue Clearance Letter**).
3. If this is the Final application for payment, then also attach: **01290.14 Contractor Affidavit for Final Payment; 01290.15 Subcontractor Affidavit for Final Payment,** if required by contract; and proof of tax compliance (**Revenue Clearance Letter**).
4. Submit current insurance certificate for the following policies General Liability, Automobile, Workers Compensation and Professional Liability upon renewal.

5. Submit Application to:

Water Services Department
Name, Project Manager
4800 E 63rd St
Kansas City, MO 64130

Contractor:

Submitted By: _____ Signature: _____ Date:_____

Phone: _____ Fax: _____ E-mail:_____

Kansas City:

Approved By: _____ Project Manager Date:_____

Approved By: _____ Director or Designee Date:_____

ATTACHMENT J

SEWER LINE INSPECTION PROTOCOL

Sewer Pipe Inspection Protocol

City of Kansas City, Missouri
Water Services Department

Smart Sewer Program

July 2021

TABLE OF CONTENTS

Page No.

LIST OF TABLES

Page No.

LIST OF FIGURES

Page No.

1.0 INTRODUCTION

All underground utilities will deteriorate over time. The City of Kansas City, Missouri (CITY) Water Services Department (KC Water) conducts periodic asset inspections to better understand rehabilitation and replacement needs of their sewer assets. These asset inspections identify problems in the sewer systems that may require repairs or replacement and help prevent catastrophic conditions. Inspections of sewer pipes:

- Determine condition of the pipe;
- Identify inflow/infiltration (I/I) sources; and
- Locate buried access points.

KC Water standardizes sewer pipe inspection procedures, defect coding, and condition grading based upon the National Association of Sewer Services Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) system. Therefore, all sewer pipe inspections will include the use of closed-circuit television (CCTV) to identify and classify defect observations based on NASSCO PACP.

However, pipe inspections may also other technologies that provide different information regarding the condition of the asset. The data collected using these technologies may be continuous or periodic, giving snapshots of the pipe condition. Pipe inspections, covered under this protocol may include one or a combination of the following technologies:

- Closed-Circuit Television (CCTV) – Continuous video recording to identify pipe defects visually
- Sound Navigation and Ranging (SONAR) – Continuous identification of obstructions and loss of pipe material below the water level
- Light Amplification by Stimulated Emission of Radiation (LASER) or Light Detection and Ranging (LIDAR) – Continuous identification of pipe loss and corrosion (usually due to hydrogen sulfide gas in sanitary sewers) above the water level
- Sewer Walk – Manual investigation of asset, where a person enters the sewer and walks the alignment
- Rebound Hammer Test – Periodic measurement of the elastic properties or strength of concrete, mainly surface hardness and penetration resistance
- Pipe Penetrating Radar (PPR) – Periodic application of electromagnetic waves to identify voids behind the pipe wall

During inspections, characteristics of the sewer system may be observed that were not viewable from the surface. It is important to update the City's Geographic Information System (GIS), the system of record for access point and pipe asset data, to reflect these observations. These GIS mapping updates of assets are integral to facilitating system maintenance, providing information for design projects, and accounting for recent infrastructure improvements.

This document provides the protocols related to sewer pipe inspections as part of the KC Water's Smart Sewer Program (SSP).

2.0 GENERAL

2.1 Inspection Conditions

To the extent practical, pipe inspections should be conducted during:

A. Low flow conditions, to observe pipe condition; and
B. High groundwater conditions, to identify sources of infiltration.

2.2 Inspectors

2.2.1 Definition

The term "*Inspector*" shall be used to describe the person completing the sewer inspection (regardless of the technology utilized) and/or operating the inspection equipment, as well as any person making edits to PACP database field values.

2.2.2 Certification

Any person making edits to PACP database field values, either collecting the field data or making changes to the data in-office, shall be NASSCO PACP-certified with a valid NASSCO PACP certification.

2.3 Prompt Attention Notification

Inspector shall immediately notify via email the SSP Project Manager and KC Water Utility Superintendent (contact information provided by SSP), regarding field observations requiring prompt attention, including but not limited to:

A. Asset failure that may pose an immediate danger to the general public (e.g. missing/broken lids, collapsed connecting pipes, sink holes)
B. Asset failure allowing significant I/I into the sanitary sewer system (e.g. such as an asset failure adjacent to a stream, allowing stream flow to enter the sewer system)
C. Information regarding backups and overflows, such as a backup or overflow occurring at the time of system characterization or inspection
D. Assets containing a flush valve (direct connection to potable water supply)

2.4 Public Notification

Most pipe inspections can be performed within in the public right-of-way. However, some pipe inspections may require access to private property or easements outside of the public right-of-way.

Therefore, notification of occupants and/or property owners is required only for those pipe inspections that require access to private property and/or easements.

2.4.1 Public Notification Procedure

A. *Inspector* shall notify the occupant and/or property owner in-person when possible, such as a door knock and face-to-face conversation. *Inspector* shall answer any questions about the work.

B. If occupant and/or property owner assistance is needed for access to complete the pipe inspection, the *Inspector* shall leave a "Manhole Access Required Door Hanger" at the residence or business.

2.4.2 Public Notification Materials

A. *Inspector* shall utilize the following Notification Materials provided on the Smart Sewer Printing Portal to facilitate Public Notification:

   i. Manhole Access Required Door Hanger

B. *Inspector* shall access Notification Materials from the Smart Sewer Printing Portal using the following instructions:

   i. Go to: kcmo.gov/printingportal
   ii. Click "Log In" at the bottom of the Welcome page.
   iii. Select "Register Now" and fill in your information.
   iv. Once the system administrator has processed your request you will be notified via email. This may take up to two (2) business days.
   v. Once approved, you will receive an email notification and can return to kcmo.gov/printingportal to log in. You will be redirected to the printing portal, or you can click the "Smart Sewer Collateral" hyperlink.

2.4.3 Public Notification Log

A. The *Inspector* shall maintain a Public Notification Log with a list of all occupants and property owners notified during the work.

B. The Public Notification Log shall include, at a minimum:

   i. Occupant or property owner's name and address;
   ii. Date notified;
   iii. Type of notification materials provided or left; and
   iv. Denied access or concerns raised by the occupant or property owner.

C. If an occupant or property owner denies access, the *Inspector* shall immediately report the situation to the SSP Project Manager via email.

D. The Public Notification Log shall be a running log, documenting subsequent conversations and/or Notification Materials left at the residence or property.
E. The Public Notification Log shall be updated daily and may be requested and reviewed by City at any time.
F. The Public Notification Log shall be included in the final data submittal.

2.5 Safety Plan

All field personnel must follow proper safety procedures including, but not limited to, the following guidelines:

A. A comprehensive safety plan must be in place before work begins, including a designated safety coordinator with a description of their job duties.
B. All National Institute for Occupational Safety and Health (NIOSH) - Occupational safety and Health Administration (OSHA) safety standards are applicable, and compliance is mandatory.
C. Traffic control – When working in street or highway rights-of-way, the traffic-controlled area shall direct vehicular traffic away from the work site following local and state traffic control requirements and the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD).
D. The work area shall be properly barricaded to direct pedestrians safely around the work area.
E. Work on major streets should be scheduled to avoid *rush hour* traffic when possible. (*Rush hour* is assumed to be from 7:00 AM – 9:00 AM and from 4:00 PM – 6:00 PM.)
F. All workers shall wear safety apparel, including but not limited to, reflective safety vests/shirts, over the ankle foot protection, toe-reinforced protection, long pants, and other necessary personal protective equipment while working within the road right-of-way.
G. Entrance into any asset shall be considered Confined Space Entry and shall require proper permitting following 29 CFR 1910.146. *Inspector* is advised that active sewer and manhole environment may be oxygen deficient, may contain toxic and/or explosive gas vapors and liquids, or may be a source of additional health hazards associated with contact with raw wastewater. No manhole shall be entered without trained personnel, proper safety equipment, testing the atmosphere, continuous monitoring of the atmosphere, and documentation for the confined space permit for the carbon dioxide (CO_2), hydrogen sulfide (H_2S) and oxygen (O_2) gas levels. Ventilation may be required to eliminate the hazard. Failure of any parameter shall preclude entry.
H. Work Stop Authority – Failure to meet safety standards will result in immediate shutdown of the field crew. If there is an unsafe situation, the field personnel can stop the task to evaluate the situation, call for help, or reschedule the task.

3.0 PIPE INSPECTION REQUIREMENTS

3.1 General

These requirements are written to promote data collection and reporting consistency and are not intended as step-by-step instructions. *Inspectors* shall use personal experience and best professional judgement during all phases of sewer pipe inspection.

3.2 Technology Platforms and Industry Standards

3.2.1 Technology Platforms

Inspector shall provide the SSP Project Manager access to an online geospatial web application that clearly displays and labels:

A. Pipes with Segment IDs
B. Access Points with UNITIDs
C. Inspection Completion Status
D. Recommended Inspection Type
E. Inspection Type Used

3.2.2 Industry Standards

Pipe inspections shall comply with latest version of NASSCO PACP.

3.3 Planning

Appropriate planning measures shall be taken prior to start of work. Planning items include, but are not limited to the following:

3.3.1 PACP Certification Credentials

Inspector names, NASSCO PACP certification numbers, and NASSCO PACP certificate expiration dates shall be provided to the SSP Project Manager at least five (5) calendar days prior to the start of work. Names provided should be those making edits to PACP database field values, either collecting the field data or making changes to the data in-office.

3.3.2 Online Geospatial Web Application Login Information

Inspector shall provide the SSP Project Manager login information for the Technology Platform at least five (5) calendar days prior to the start of work.

3.3.3 City GIS

City will provide GIS files that indicate pipe segments to be inspected and/or access points to be located, including unique identifiers for upstream and downstream access points (e.g., manholes, inlets).

3.3.4 CNO, CNL, and CNA Lists

SSP will provide lists of access points that could not be opened (CNO), could not be located (CNL), and/or could not be accessed (CNA) during system characterization and/or access point inspections to *Inspector*, if applicable.

3.3.5 Supplemental Information

SSP may provide supplemental information to *Inspector*. *Inspector* shall use supplemental information (if provided) to aid system characterization and/or access point inspections. Supplemental information may include:

A. Map(s) in portable digital format (PDF) of pipe segments to be inspected, based on the City GIS files provided
B. Sewer Record Books
C. Other documents, as applicable.

3.3.6 Flow Control/Bypass Pumping

Inspector should schedule inspections during periods of low flow to maximize the viewing area and the extent of the inspection; flow levels during inspections should be no greater than 15% of the pipe diameter (or height if non-circular pipe shape).

A. If assistance is required to aid in the control of flow within a pipe, then *Inspector* shall notify the SSP Project Manager at least seventy-two (72) hours in advance of the scheduled inspection.
B. If flow levels cannot be adequately lowered, the *Inspector* shall coordinate through the SSP Project Manager the use of other methods of flow control such as plugging or bypass pumping.
C. *Inspector* may request permission for nighttime work where flows cannot be adequately controlled. *Inspector* shall submit requests for nighttime work to the SSP Project Manager at least seventy-two (72) hours in advance of the scheduled inspection.

3.4 Equipment

Equipment used when performing pipe inspections and access point location services, shall meet the following specifications:

3.4.1 Two-Way Communication

All *Inspectors* and crew members shall carry a cellular phone or other form of two-way communication.

3.4.2 Manned-Entry

A. If confined space entry is necessary, the *Inspector* shall provide all equipment necessary for a safe working condition and entry in conformance with Section 2.5 Safety Plan.

B. Entry into access points (i.e. manholes, inlets) shall not rely on use of existing steps within the access point.

3.4.3 Sonde Equipment

A. In-line sewer inspections provide information about the sewer system that may not be visible from surface and/or access point inspections such as bends and buried access points. Therefore, all sewer inspections shall be performed with accompanying sonde equipment for locating these alignment changes and/or buried access points.

B. Sonde equipment shall have the capability of being located to a depth of at least 20 feet.

3.4.4 GPS Equipment

A. Equipment used must be capable of providing global positioning system (GPS) coordinates for horizontal location (X & Y coordinates) and elevation (Z coordinate).

B. All GPS equipment shall be in calibration/adjustment and verified against a known baseline or existing control with similar relative accuracy prior to start of work.

C. Equipment utilized for surveying shall be of the same make and model per project for consistency of data collection and accuracy.

D. MACP "Survey Level" GPS equipment should be used when possible.

E. If GPS coordinates with "Survey Level" accuracy cannot be obtained, MACP "Sub-Meter" accuracy equipment may be used.

F. If GPS coordinates with "Sub-Meter" accuracy cannot be obtained, then GPS equipment with MACP "Nearest Meter" accuracy may be used.

G. GPS coordinates of an access point may be obtained by location offset from the access point using traditional survey techniques via triangulation or distance/bearing references. The GPS Type shall be classified based on the GPS accuracy (Survey Level, Sub-Meter, Nearest Meter) of the reference location and the techniques used to calculate the horizontal location and elevation of the asset.

H. If no GPS coordinates can be obtained, including via offset, due to site specific constraints, then the access point location may be updated based on aerial photography.

3.4.5 CCTV Equipment

The CCTV equipment shall have the following minimum features and capabilities:

A. The equipment shall be a pushing cable, tractor, or float unit.
   (Exception: CCTV equipment may be mounted to *Inspector* for Sewer Walks ONLY).
B. The camera shall be designed specifically for pipe inspections.
C. The equipment shall be fog-resistant, capable of operating in 90% humidity.
D. The equipment shall include a cable footage counter so that the location of defects and service laterals relative to the starting access point location can be reported.
   i. The cable footage counter shall be able to reach a minimum of 1,000 feet.
   ii. The footage counter shall be accurate to 0.5 feet per 100 feet (0.5%) and shall be calibrated every two (2) weeks.
   iii. Calibration may be performed by checking the cable footage counter against a pre-measured length of 50 to 300 feet.
E. The equipment shall have either manual or digital pan, tilt, and/or zoom capabilities to facilitate defect viewing.
F. The equipment shall have a minimum of 640 lines of resolution, with a minimum of 1280 lines of resolution for High-Definition CCTV (HDCCTV).
G. The equipment shall record full color video.
H. The equipment shall have automatic and/or remote focus and iris control.
I. The equipment shall be capable of producing MP4 video recordings of each segment inspected.
J. The equipment shall include a lamp capable of lighting the entire periphery of the pipe.
K. If sewer service laterals are to be inspected, the equipment shall include a “side-shot” camera tool provided specifically for lateral inspections.
L. The equipment shall be able to fit through a minimum opening width of 20.625 inches.
M. The equipment shall be capable of recording defects in accordance with the NASSCO PACP defect coding system.
N. The equipment shall produce deliverables of quality acceptable to the City.
   i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
   ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.4.6 SONAR Equipment

The SONAR equipment shall have the following minimum features and capabilities:

A. The equipment shall be specifically designed for pipe inspections.
B. The equipment shall be capable of being mounted on a float or tractor.
C. The equipment shall have integrated pitch and roll sensing.
D. The equipment shall be capable of recording data to be related to pipe circumferential position and relative location as measured from the access point.
E. The equipment shall be capable collecting and recording data for up to 3 hours.
F. The equipment shall be capable of producing a summary of cross-sectional imagery showing pipe restrictions, voids/defects and estimated quantity of debris.
G. The equipment shall be capable of transmitting continuous, digital data for topside viewing.
H. The equipment shall have a frequency greater than or equal to 2 MHz.
I. The equipment shall have an acoustic beam width less than or equal to 1.8-degrees conical.
J. The equipment shall be able to fit through a minimum opening width of 20.625 inches.
K. The equipment shall be capable of recording defects in accordance with the NASSCO PACP defect coding system.
L. The equipment shall produce deliverables of quality acceptable to the City.
    i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
    ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.4.7 LASER Equipment

The LASER equipment shall have the following minimum features and capabilities:

A. The equipment shall be specifically designed for pipe inspections.
B. The equipment shall be capable of being mounted on a float or tractor.
C. The equipment shall be fog-resistant, capable of operating in 90% humidity.
D. The equipment shall be capable collecting and recording data for up to 3 hours.
E. The equipment shall be capable of transmitting continuous, digital data for topside viewing.
F. The equipment shall have a minimum frame rate of 10 frames per second.
G. The equipment shall have an angular resolution of 0.25-degrees or better.
H. The equipment accuracy shall be a minimum of 0.3% at 30 feet.
I. The equipment shall be able to fit through a minimum opening with of 20.625 inches.
J. The equipment shall be capable of recording defects in accordance with the NASSCO PACP defect coding system.
K. The equipment shall produce deliverables of quality acceptable to the City.

i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.4.8 LIDAR Equipment

The LIDAR equipment shall have the following minimum features and capabilities:

A. The equipment shall be specifically designed for pipe inspections.
B. The equipment shall be capable of being mounted on a float or tractor.
C. The equipment shall be fog-resistant, capable of operating in 90% humidity.
D. The equipment shall be capable collecting and recording data for up to 3 hours.
E. The equipment shall be capable of transmitting continuous, digital data for topside viewing.
F. The equipment shall have an angular resolution of 0.25-degrees or better.
G. The equipment accuracy shall be a minimum of 0.3% at 30 feet.
H. The equipment shall be able to fit through a minimum opening with of 20.625 inches.
I. The equipment shall be capable of recording defects in accordance with the NASSCO PACP defect coding system.
J. The equipment shall produce deliverables of quality acceptable to the City.
    i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
    ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.4.9 Sewer Walk Equipment

A. Sewer walks shall be conducted using all equipment necessary for a safe working condition (see Section 2.5 Safety Plan).
B. All sewer walks shall be performed with CCTV equipment (see Section 3.4.5 CCTV Equipment) and additional testing equipment (see Section 3.4.10 PPR Equipment and/or Section 3.4.11 Rebound Hammer Test Equipment) as applicable.
C. The equipment shall produce deliverables of quality acceptable to the City.
    i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
    ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.4.10 PPR Equipment

The PPR equipment shall have the following minimum features and capabilities:

A. PPR shall have a penetration depth of five (5) feet in cohesive soils.
B. The equipment shall be able to fit through the frame of a circular manhole with a diameter of 20.625-inches.
C. The equipment shall produce deliverables of quality acceptable to the City.
    i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
    ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.4.11 Rebound Hammer Test Equipment

The Rebound Hammer Test (also referred to as the Swiss/Schmidt Hammer Test) measures the relative compressive strength of rigid pipe materials, most often concrete. The equipment shall have the following minimum features and capabilities:

A. The Rebound Hammer shall be calibrated per manufacturer requirements.
B. The Rebound Hammer shall be designed for use on the pipe material being tested and shall not be operated in such a way that damages the assets being tested.
C. The equipment shall produce deliverables of quality acceptable to the City.
    i. Equipment that does not produce deliverables of quality acceptable to the City shall be replaced, at no additional cost to the City.
    ii. For deliverables that are not accepted by the City, the inspection shall be re-conducted at no additional cost to the City.

3.5 Access Point Location

3.5.1 Assets Designated Could Not Open (CNO) during System Characterization

A. If applicable, City will provide *Inspector* with a list of assets that were designated as Could Not Open (CNO) during system characterization and/or access point inspections, the CNO List.
B. The *Inspector* shall attempt to open the assets on the CNO List.
C. *Inspector* shall update status designations in the CNO List (Attachment 1) per Section 3.6 Status Designations.
D. *Inspector* shall update relevant fields in the CNO List.

E. *Inspector* shall provide an Area Photo for each access point on the CNO List.
F. If the access point cover is broken or damaged during attempt to open the structure, *Inspector* shall notify the City and SSP Project Manager immediately and remain on-site until the City arrives with a replacement cover.

3.5.2 Assets Designated Could Not Locate (CNL) during System Characterization

A. If applicable, City will provide *Inspector* with a list of assets that were designated as Could Not Locate (CNL) during system characterization and/or access point inspections, the CNL List.
B. The *Inspector* shall attempt to locate and open the assets on the CNL List.
C. *Inspector* shall update status designations in the CNL List (Attachment 2) per Section 3.6 Status Designations.
D. *Inspector* shall update relevant fields in the CNL List.
E. *Inspector* shall provide an Area Photo for each access point on the CNL List.
F. If the access point cover is broken or damaged during attempt to open the structure, *Inspector* shall notify the City and SSP Project Manager immediately and remain on-site until the City arrives with a replacement cover.

3.5.3 Assets Designated Could Not Access (CNA) during System Characterization

A. If applicable, City will provide *Inspector* with a list of assets that were designated as Could Not Access (CNA) during system characterization and/or access point inspections, the CNA List.
B. The *Inspector* shall attempt to access, locate, and open the assets on the CNA List.
C. *Inspector* shall update status designations in the CNA List (Attachment 3) per Section 3.6 Status Designations.
D. *Inspector* shall update relevant fields in the CNA List.
E. *Inspector* shall provide an Area Photo for each access point on the CNA List.
F. If the access point cover is broken or damaged during attempt to open the structure, *Inspector* shall notify the City and SSP Project Manager immediately and remain on-site until the City arrives with a replacement cover.

3.6 Status Designations

A. **Opened** – *Inspector* was able to open the access point.
    i. *Inspector* shall update the COORD_X and COORD_Y of the access point in the CNO List (if applicable).
B. **Located & Opened** – *Inspector* was able to locate and open the access point.

i. *Inspector* shall update the COORD_X and COORD_Y of the access point in the CNL or CNA List (if applicable).

C. **Could Not Open (CNO) - Seized** – *Inspector* was unable to open the access point because the frame and/or cover was corroded, damaged.

i. *Inspector* shall update the COORD_X and COORD_Y of the access point in the CNO, CNL, or CNA List (if applicable).

ii. If the access point cannot be opened due because the frame and/or cover was corroded, damaged, *Inspector* shall update the CNO, CNL, or CNA List (if applicable), describing what attempts were made to open the access point.

iii. For assets not in the CNO, CNL, or CNA List (if applicable), *Inspector* shall:

a. Update the Project Summary Report (see Section 5.9 Project Summary Report), including in the significant issue description field the status designation and what attempts were made to open the access point.

b. Include the issue in the Project Status Report (see Section 5.3 Project Status Reports).

D. **Could Not Open (CNO) - Buried** – *Inspector* was able to locate the access point and obtain or attempt to obtain GPS coordinates, but was not able to open the access point because it was buried under pavement or under debris/earthen materials 6 inches or greater.

i. If the access point is buried under debris/earthen materials less than 6 inches, then *Inspector* shall remove the soil, grass, or rocks. Access points that are uncovered shall not be assigned the status designation "Could Not Open (CNO) - Buried".

ii. If the access point cannot be opened due to burial, *Inspector* shall update the CNO, CNL, or CNA List (if applicable), describing what the access point is Buried Under and the Buried Depth for access points buried under debris/earthen materials (e.g., under pavement, under debris/earthen materials, 6 inches).

iii. For assets not in the CNO, CNL, or CNA List (if applicable), *Inspector* shall:

a. Update the Project Summary Report (see Section 5.9 Project Summary Report), including in the significant issue description field the status designation and what the access point is Buried Under and the Buried Depth for access points buried under debris/earthen materials (e.g., under pavement, under debris/earthen materials, 6 inches).

b. Include the issue in the Project Status Report (see Section 5.3 Project Status Reports).

E. **Could Not Access (CNA) - Temporary** – *Inspector* was unable to access the access point with reasonable effort due to a temporary access issue (e.g., resident was not home to obtain permission for entry onto private property, car parked over asset, dog in backyard, asset was inside a locked gate, locked public facility, etc.).

i. *Inspector* shall update the CNO, CNL, or CNA List (if applicable), describing in the comments field why the asset could not be accessed (e.g., parked car, locked gate, dog in yard, etc.).

ii. For assets not in the CNO, CNL, or CNA List (if applicable), *Inspector* shall:

a. Update the Project Summary Report (see Section 5.9 Project Summary Report), including in the significant issue description field the status designation and why the asset could not be accessed (e.g., parked car, locked gate, dog in yard, etc.).

b. Include the issue in the Project Status Report (see Section 5.3 Project Status Reports).

F. **Could Not Access (CNA) - Permanent** – *Inspector* was unable to access the access point due to a permanent access issue (e.g. permanent structure built on top of the asset, such as a deck, fence, building, playground equipment, access point raised 8 feet in the air,).

i. *Inspector* shall update the CNO, CNL, or CNA List (if applicable), describing in the comments field why the asset could not be accessed (e.g. deck, raised 8 feet in the air, etc.).

ii. For assets not in the CNO, CNL, or CNA List (if applicable), *Inspector* shall:

a. Update the Project Summary Report (see Section 5.9 Project Summary Report), including in the significant issue description field the status designation and why the asset could not be accessed (e.g., deck, raised 8 feet in the air, etc.).

b. Include the issue in the Project Status Report (see Section 5.3 Project Status Reports).

G. **Could Not Locate (CNL)** – *Inspector* was unable to locate the access point from surface investigations (see Section 3.6.4 Surface Investigations) but was able to confirm that the access point exists during inspection of sewer pipe (see Section 3.6.3 Subsurface Investigations).

i. *Inspector* shall update the CNO or CNA List (if applicable), describing in the comments field what efforts were made to locate the access point (e.g., field search, metal detector, sonde, etc.).

ii. For assets not in the CNO or CNA List (if applicable), *Inspector* shall:

a. Update the Project Summary Report (see Section 5.9 Project Summary Report), including in the significant issue description field the status designation and what efforts were made to locate the access point (e.g., field search, metal detector, sonde, etc.).

b. Include the issue in the Project Status Report (see Section 5.3 Project Status Reports).

H. **Does Not Exist (DNE)** – *Inspector* was unable to locate the access point during inspection of the sewer pipe (see Section 3.6.3 Subsurface Investigations) or surface investigations (see Section 3.6.4 Surface Investigations).

i. *Inspector* shall update the CNO, CNL, or CNA List (if applicable), describing in the comments field what efforts were made to locate the access point (e.g., field search, metal detector, sonde, etc.).

ii. *Inspector* shall add DNE access points that are displayed in the City GIS, to the Map Change Form "DNE" (see Section 5.14 Map Change Forms).

a. *Inspector* shall provide the UNITID of the access point that Does Not Exist (DNE) and any relevant comments such as field what efforts were made to locate the access point (e.g., field search, metal detector, sonde, etc.).

b. *Inspector* shall maintain a running log of all DNE access points using the Map Change Form "DNE" (see Section 5.14 Map Change Forms).

3.6.2 Field Investigations

3.6.3 Subsurface Investigations

Inspector shall attempt to locate the missing access point from the subsurface (while conducting sewer inspection) utilizing specialty equipment such as a CCTV camera sonde transmitter.

3.6.4 Surface Investigations

A. *Inspector* shall attempt to locate the missing access points from the surface.

B. These surface investigations shall be performed for approximately 20 minutes and shall include:

i. *Inspector* shall make all reasonable effort to conduct a field search to locate the access point. Access points may be in difficult areas such as overgrown easements or in congested areas (e.g., intersections), where several access points may be present and some buried or paved over.

ii. *Inspector* shall conduct a comparison of field conditions against the City GIS, aerial imagery, and supplemental information (if provided by City) to locate the access point.

iii. *Inspector* shall utilize specialty equipment such as metal detectors to attempt to locate the access point.

3.7 Area Photo

A. In addition to Area Photos required for Section 3.5 Access Point Location, *Inspector* shall provide an Area Photo of each access point that the *Inspector* Could Not Open (CNO) and Could Not Locate (CNL) that were not included on the CNO, CNL, and CNA Lists (see Section 3.5 Access Point Location).

B. The Area Photo shall document the manhole location and surrounding area.

C. The photograph shall be taken at a vantage point that allows the marking paint to be visible and at least one identifiable fixed landmark visible in the background or side ground.
D. The photograph shall include a plaque bearing the asset unique identifier and the camera cardinal direction; or should have the asset unique identifier and the camera cardinal direction digitally overlain on the photograph such that it will not interfere with the image of the asset opening.
E. See Figure 3.1 for an example.

Figure 3.1: Example Area Photo

3.8 Asset Identification

3.8.1 Unique Identifier Naming Convention for Point Feature Assets

Point feature assets are assigned a unique identifiers in the City GIS UNITID attribute field by the following four-part naming convention:

A. Part 1 – South "S" or North "N" designator based on location relative to the Missouri River
B. Part 2 – Three-digit sewer atlas number
C. Part 3 – Operator or alphabetical character:
    i. Manhole to Inspect (wwManhole): Hyphen "-"
    ii. Inlet to Inspection (swInletPoint): "I"
    iii. Fitting (wwFitting): "F"
D. Part 4 – Three-digit or four-digit asset number within the sewer atlas, determined by asset type:

i. Manhole (wwManhole): Three-digit
ii. Inlet (swInletPoint): Four-digit
iii. Fitting (wwFitting): Four-digit

E. Examples:
   i. Manhole (wwManhole)
      a. Description: Manhole asset number 200 on sewer atlas 24, south of the Missouri River
      b. UNITID: S024-200.
   ii. Inlet (swInletPoint)
      a. Description: Inlet asset number 200 on sewer atlas 24, south of the Missouri River
      b. UNITID: S024I0200.
   iii. Fitting (wwFitting)
      a. Description: Fitting asset number 200 on sewer atlas 24, south of the Missouri River
      b. UNITID: S024F0200

3.8.2 Identifying and Naming New Structures

A. Access points and fittings are sometimes not yet identified in the City's GIS or are newly constructed.

B. *Inspector* shall temporarily name the newly discovered structure by assigning the UNITID of the nearest upstream access point and sequentially adding the suffix "a", "b", "c", etc. See example in Figure 3.2.

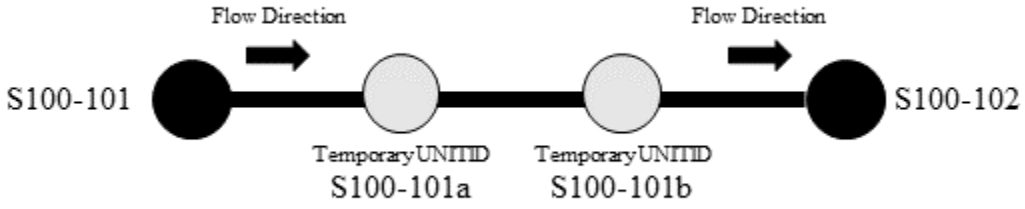


Figure 3.2: Temporary UNITID for Newly Identified Manholes

C. *Inspector* shall add access points discovered in the field, which are not displayed in the City GIS, to the Map Change Form "New Structure" (see Section 5.14 Map Change Forms).
   i. *Inspector* shall periodically request permanent UNITIDs from the SSP Project Manager and replace all temporary UNITIDs in the deliverables prior to deliverable submittal.
   ii. *Inspector* shall provide the structure type (e.g., manhole, inlet, or other), X-coordinate, and Y-coordinate (coordinates in State Plane Coordinate System Missouri West 2403, feet),

original pipe segment reference, and revised upstream and downstream pipe segment references for the assets that need a UNITID.

iii. *Inspector* shall maintain a running log of all permanent UNITIDs requested from the SSP Project Manager using the Map Change Form "New Structure" (see Section 5.14 Map Change Forms).

3.8.3 Changing Structure Types

A. If an access point or fitting asset is on the incorrect feature layer, *Inspector* shall add a the structure to the Map Change Form "Structure Type" (see Section 5.14 Map Change Forms).
   i. Examples:
      a. Access point is incorrectly identified as an "Inlet" when it should be a "Manhole"
      b. Access point is incorrectly identified as a "Manhole" when it should be an "Inlet"
      c. Asset is incorrectly identified as a "Fitting" when it should be a "Manhole"
      d. Asset is incorrectly identified as a "Fitting" when it should be an "Inlet"
      e. Asset is incorrectly identified as a "Manhole" when it should be a "Fitting"
      f. Asset is incorrectly identified as a "Inlet" when it should be an "Fitting"
B. *Inspector* shall periodically request permanent UNITIDs from the SSP Project Manager for those assets which need a change in structure type and replace all original UNITIDs of the wrong structure type in the deliverables prior to deliverable submittal.
C. *Inspector* shall provide the original UNITID, original structure type (e.g., manhole, inlet, or other), and revised structure type for the assets that need a new UNITID.
D. *Inspector* shall maintain a running log of all permanent UNITIDs requested from the SSP Project Manager using the Map Change Form "Structure Type" (see Section 5.14 Map Change Forms).

3.9 Inspection and Data Collection

3.9.1 General

A. The overall effectiveness of sewer inspections is directly related to the completeness and accuracy of the data collected.
B. At a minimum, all sewer inspections shall include CCTV.
C. The recommended inspection type will be provided by the City. Recommended inspection type includes but is not limited to the following:
   i. CCTV
   ii. CCTV + SONAR + LASER/LIDAR
   iii. CCTV Sewer Walk

D. The Inspector shall use best judgement when performing inspections based on these recommendations or determining if SONAR and/or LASER/LIDAR data should be processed.

E. *Inspector* shall perform sewer pipe inspections from access point to access point unless a pipe converges into another pipe alignment at a fitting; then the inspection shall be performed from access point to fitting. See Figure 3.3.

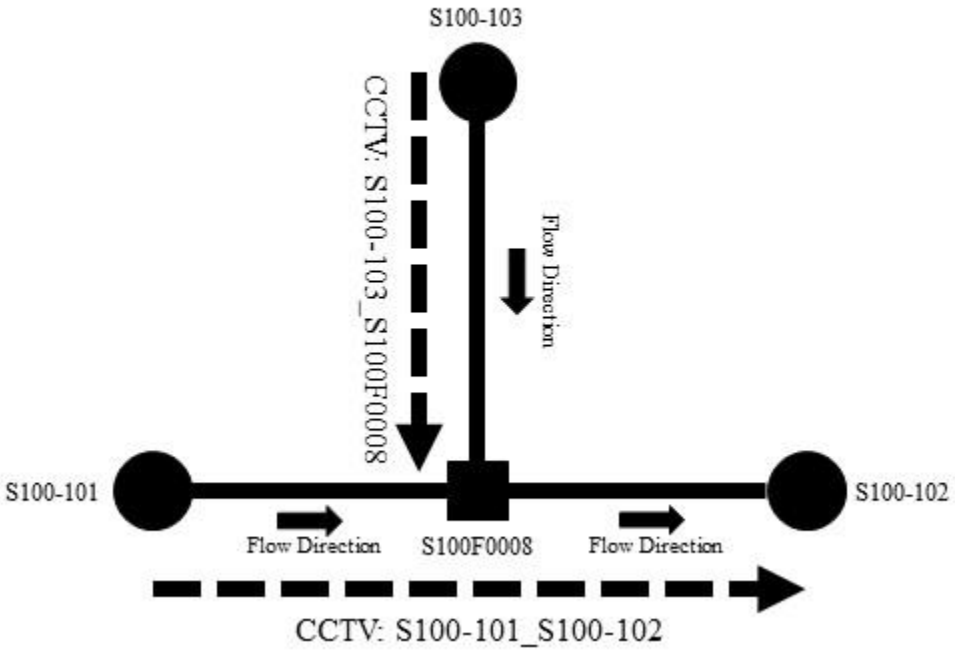


Figure 3.3: Performing Sewer Pipe Inspections

3.9.2 Alternative Inspection Technology Notification

A. The *Inspector* shall notify the SSP Project Manager, via email, within 24 hours for sewer inspections where the recommended inspection type is:

   i. Insufficient to obtain a wholistic condition assessment of the sewer asset based on field observations; or

   ii. Unsafe to perform (as determined by the *Inspector*) due to encountered field conditions.

B. The *Inspector* shall recommend an alternate inspection technology based on the field conditions and limitations of the equipment. The *Inspecto*r may proceed with alternate technology upon receipt of written approval by the SSP Project Manager.

3.9.3 Sewer Line Cleaning

A. *Inspector* shall perform sewer line cleaning work in an upstream to downstream approach.

B. The use of various sewer line cleaning methods (Light Cleaning, Heavy Cleaning, and Mechanical Cleaning) shall be as required per the Contract Documents.

C. If light cleaning equipment fails to traverse the entire pipe section or *Inspector* believes that the amount of debris present in a pipe segment cannot be removed by light cleaning, *Inspector* shall notify the SSP Project Manager via email including photographic documentation of the debris, the proposed cleaning method (Heavy Cleaning or Mechanical Cleaning), and an estimate of the time to remove the debris. If the debris cannot be removed or if the time to remove the debris exceeds 25% of the original estimate for time to remove the debris, *Inspector* shall notify the SSP Project Manager via email within 24 hours.

   i. Light Cleaning shall be defined as up to three (3) slow passes with high-velocity jet-cleaning equipment (per Specification 02676 Sewer Line Cleaning) and/or up to one (1) pass with root-cutting equipment if roots are present.

   ii. Heavy Cleaning shall be defined as more than three (3) passes with high-velocity jet-cleaning equipment (per Specification 02676 Sewer Line Cleaning) and/or more than one (1) pass with root-cutting equipment if roots are present.

   iii. Mechanical Cleaning shall be defined as the use of any mechanically-powered equipment (per Specification 02676 Sewer Line Cleaning) that is not included in Light Cleaning or Heavy Cleaning.

D. If sewer line cleaning fails to remove the obstruction, the *Inspector* shall attempt to complete the inspection using a reverse set-up.

3.9.4 CCTV

Inspector shall perform CCTV inspections in accordance with the following guidelines:

A. CCTV equipment shall meet the requirements of Section 3.4.5 CCTV Equipment.

B. High-Definition (HDCCTV) shall be used for all sewer lines greater than or equal to 48-inches in diameter (or when height and/or width of non-circular pipe is greater than or equal to 48 inches).

C. Lighting during the inspection shall adequately, but not excessively, illuminate the periphery of the pipe.

D. To limit distortion the camera should be centered in the middle of the pipe to the extent that is practically possible by use of specialized CCTV equipment designed for large diameter sewers.

E. The camera shall move at a steady pace not to exceed 30 feet per minute.

F. The camera should stop to view defects and provide still photos in JPEG format.

G. The camera should stop to view all construction features (including but not limited to service connections and storm/sanitary main connections) and provide still photos in JPEG format.

H. The camera shall capture the general condition of the access points and other incoming and/or outgoing pipes in the starting access point (launch manhole) and ending access point.

I. If an unidentified access point is encountered during the inspection, the inspection shall stop, and a temporary UNITID shall be assigned to the previously unidentified asset per Section 3.8.2 Identifying and Naming New Structures.

   i. Inspector shall submit a Map Change Form (see Section 5.14 Map Change Forms) to the SSP Project Manager to request a permanent UNITID for the newly identified asset prior to deliverable submittal.

   ii. The inspection documentation and video display shall be renamed to reflect the permanent UNITID, not the temporary UNITID assigned by the *Inspector*.

   iii. This change shall also be submitted on the Project Summary Report (see Section 5.9 Project Summary Report).

J. If an abandoned or removed access point is encountered during the inspection, the inspection documentation and video display shall be renamed to reflect the nomenclature of upstream access point to downstream access point for the inspected pipe segment. This change shall also be submitted via Map Change Form (see Section 5.14 Map Change Forms) and on the Project Summary Report.

K. If the flow direction of the pipe segment is different than displayed in the City GIS, the inspection documentation and video display shall be renamed to reflect the nomenclature of upstream access point to downstream access point for the inspected pipe segment. This change shall also be submitted via Map Change Form (see Section 5.14 Map Change Forms).

3.9.5 SONAR

Sound Navigating and Ranging (SONAR) technology may be used to supplement CCTV inspection of sewer lines. SONAR is primarily used to quantify the amount of debris in the pipe to educate operations and maintenance decisions. SONAR may also be used to identify defects in the sewer line below the flow level. SONAR, when used in conjunction with CCTV, can provide a simultaneous image of the sewer asset both above and below the flow level.

A. *Inspector* shall use SONAR to supplement CCTV inspections when the pipe diameter is greater than or equal to 48 inches (or when height and/or width of non-circular pipe is greater than or equal to 48 inches) and the condition of the bottom of the pipe cannot be determined by CCTV inspection alone due to flow conditions.

B. SONAR equipment shall meet the requirements of Section 3.4.6 SONAR Equipment.

C. *Inspector* shall not process SONAR data unless requested by CITY or if insufficient flow depth was present. Inspector shall store unprocessed SONAR data in a format that can be readily processed upon request by the CITY for a minimum of three (3) years after project closeout.
D. If SONAR processing is requested, *Inspector* shall spatially align SONAR inspection data to CCTV inspection data and append the information collected by SONAR technology to the PACP database deliverable.
    i. *Inspector* shall code SONAR-observed debris/blockages as Deposit Settled Other (DSZ) and input the percentage per PACP standards.
E. SONAR inspection data shall include graphic simulations illustrating conditions below the flow line and cross-sectional imagery identifying pipe restrictions, corrosion, and debris, if present.

3.9.6 LASER or LIDAR

LASER or LIDAR (LASER/LIDAR) technology may be used to supplement CCTV inspection of sewer assets. LASER/LIDAR technology may be used to measure the interior pipe wall and identify deformations of the pipe above the flow level. This technology is typically used in concrete pipe to identify H2S corrosion and pipe loss. LASER/LIDAR inspections can be conducted to document pipe construction, observe flow conditions, and determine depth of debris and structural integrity above the flow line. Graphs of corrosion and buildup can be used to quantify loss or gain of pipe wall along the asset alignment. High-resolution scans showing the pipe cross sections can be used to determine the inside pipe diameter, ovality, and eccentricity of the asset.

A. *Inspector* shall use LASER/ LIDAR to supplement CCTV inspections (and SONAR inspections, when applicable) when the pipe diameter is greater than or equal to 48 inches (or when height and/or width of a non-circular pipe is greater than or equal to 48 inches) and LASER/ LIDAR was the recommended inspection type provided by the City.
B. LASER and/or LIDAR equipment shall meet the requirements of Section 3.4.7 LASER Equipment or Section 3.4.8 LIDAR Equipment, respectively, as applicable.
C. *Inspector* shall not process LASER or LIDAR data unless requested by CITY. *Inspector* shall store unprocessed LASER and LIDAR data in a format that can be readily processed upon request by the CITY for a minimum of three (3) years after project closeout.
D. If LASER or LIDAR processing is requested, *Inspector* shall spatially align LASER/LIDAR inspection data to CCTV inspection data (and SONAR inspection data, when applicable) and append the information collected by LASER/LIDAR technology to the PACP database deliverable.

i. *Inspector* shall code LASER/LIDAR-observed pipe ovality greater than or equal to 5% based on the pipe material (rigid, flexible, or brick) and input the percentage per PACP standards. Most commonly used PACP defect codes for pipe ovality include Deformed Rigid (DR) Deformed Flexible Bulging Round (DFBR), and Deformed Brick Bulging Round (DTBR).

ii. *Inspector* shall code LASER/LIDAR-observed pipe wall loss due to corrosion based on estimated wall loss expressed as a percentage as follows, assuming an initial wall thickness based on equivalent circular inside pipe diameter per Table 3.1 when as-built records are unavailable:

   a. Surface Roughness Increased (SRI): 5% to less than 10% pipe wall lost
   b. Surface Aggregate Visible (SRV): 10% to less than 20% pipe wall lost
   c. Surface Aggregate Missing (SAM): 20% to less than 40% pipe wall lost
   d. Surface Reinforcement Visible (SRV): 40% to less than 50% pipe wall lost
   e. Surface Reinforcement Protruding (SRP): 50% to less than 100% pipe wall lost
   f. Surface Missing Wall (SMW): 100% of pipe wall lost

Table 3.1: Assumed Pipe Wall Thickness Based on Inside Pipe Diameter

Inside Pipe Diameter (inches)	Wall Thickness (inches)
48	5.00
54	5.50
60	6.00
66	6.50
72	7.00
78	8.25
54	8.75
90	9.25
96	9.75
108	10.75
120	11.75

iii. *Inspector* shall code LASER/LIDAR-observed debris/blockages as Deposit Settled Other (DSZ) and input the percentage per PACP standards.

E. LASER/LIDAR inspection data shall include graphic simulations illustrating conditions below cross-sectional imagery identifying pipe restrictions, corrosion, ovality, and debris, if present.

3.9.7 Sewer Walk

Sewer walks, a manned-entry inspection technique, with the aid of video equipment allows the inspector, to assess and document the internal condition of sewer assets. Manned-entry inspections provide

flexibility for the inspector to use additional tests to assess the assets condition such as PPR and/or Rebound Hammer Test.

A. Sewer Walks shall be conducted in accordance with Section 2.4 Safety Plan.
B. *Inspector* shall perform Sewer Walks with CCTV inspections (per Section 3.3.3 CCTV) when the pipe diameter is greater than or equal to 72 inches (or when height of a non-circular pipe is greater than or equal to 72 inches), the observed flow depth is less than 12 inches and/or less than 2 feet per second, and the "CCTV Sewer Walk" was the recommended inspection type provided by the City.
C. CCTV equipment shall meet the requirements of Section 3.3.3 CCTV.
D. Inspector shall spatially align observed defects identified by visual inspection and additional test(s) to CCTV inspection data (when applicable) and append the ancillary information collected to the PACP database deliverable.

3.9.8 PPR

Pipe Penetrating Radar (PPR) is an electromagnetic technology that can detect voids within or behind brick or concrete sewer assets. The depth PPR can penetrate is dependent on pipe material and the soil conditions. PPR can also use these radar pulses to identify cracks, corrosion, and other deformations. Radar pulses in the pipe wall are reflected and refracted by sharp changes in material; the greater the difference in the material properties, the more energy that is reflected.

A. *Inspector* may use PPR to supplement Sewer Walk inspections (See 3.5.7 Sewer Walk) when inspector suspects voids behind the pipe wall.
B. *Inspector* shall input defect information collected by PPR technology to the PACP database deliverable.

3.9.9 Rebound Hammer Test

The Rebound Hammer Test may be used to assess material uniformity and determine the compressive strength of the pipe asset.

A. Rebound Hammer Tests shall be performed as follows:
    i. Per ASTM C805 (hardened concrete) or ASTM D5873 (rock) as applicable based on the observed pipe material.
    ii. All rebound hammer tests shall be conducted in-situ. No core samples shall be collected without written authorization by the City.

iii. Test areas shall be located every 50 linear feet and at the 3-, 9-, and 12 o'clock positions circumferentially within the pipe unless otherwise directed by the City.

B. Inspector shall use caution when conducting Rebound Hammer Tests to not cause damage to the asset. Inspector shall not perform test if inspector is concerned that test will damage asset. For example, a Rebound Hammer calibrated for hardened concrete shall not be used on mortar in brick joints.

C. Inspector shall input information collected to the PACP database deliverable in the notes field as clock position, followed by average test result at each clock position tested.

3.9.10 Inspection Completion Status

A. **Full** – *Inspector* was able to complete the sewer pipe inspection from upstream access point to downstream access point.

B. **Partial** – *Inspector* was unable to complete the sewer pipe inspection from upstream access point to downstream access point due to some issue encountered within the pipe; however some of the pipe alignment was inspected.

C. **Unable to Complete (UTC)** – *Inspector* was unable to complete the sewer pipe inspection in any capacity.

4.0 QUALITY CONTROL

4.1 *Inspector's* Quality Control Procedure

A. *Inspector* shall define the extent, nature, and implementation of their quality control/quality assurance (QA/QC) program prior to the start of work.

B. The *Inspector's* QA/QC plan shall be submitted to the City prior to the start of work.

C. At a minimum collected field data review shall conform to the requirements of the Section **Error! Reference source not found. Error! Reference source not found.**.

D. QA/QC reviews of the videos and completed field entry forms, and database information shall be performed in preparation of final data deliverables.

4.2 NASSCO PACP Quality Control Procedure

Inspector shall follow the NASSCO PACP Quality Control (Attachment 5).

4.3 City's Quality Control Procedure

The following sections outline the City's minimum quality control procedures. The City reserves the right to adjust quality control reviews based on the performance of the *Inspector*.

4.3.1 Preinspection Verification of Deliverables

A. Within fourteen (14) calendar days following the Inspector's Notice to Proceed, the *Inspector* shall submit an example deliverable in conformance with Section 5.0 Deliverables.

B. The City will review and provide comments on the example deliverable's compliance with this protocol.

C. Pending City review of the example deliverable, *Inspector* may be requested to resubmit a revised example deliverable, addressing City review comments.

4.3.2 Audits

The City reserves the right to audit, at will, the Inspector's quality control procedure.

4.3.3 Data Management QA/QC

4.3.3.1 Data Management Quality Review

The City will perform data management quality control reviews of each deliverable. The City's data management quality control review consists of reviews for completeness, accuracy and conformance to this protocol. At a minimum the City will review the following:

A. The following deliverables were submitted with each package:
   i. PACP Access Database
      a. CCTV Video (linked to Access Database)
      b. Feature/Defect Photographs (linked to Access Database)
   ii. PACP Pipe Run, Scoring, and Feature/Defect Photograph Reports
   iii. SONAR, LASER, LIDAR, Rebound Hammer Test, and/or PPR Data Files and Reports
   iv. Project Summary Report
   v. Could Not Open (CNO) List
   vi. Could Not Locate (CNL) List
   vii. Map Change Forms (tabular summary and schematics, as required)
B. The following deliverables were submitted with each Project Status Report:
   i. Could Not Open (CNO) List
   ii. Could Not Locate (CNL) List
   iii. Could Not Access (CNA) List and Clearing Request Maps
   iv. Cable Footage Calibration Log
   v. Schedule
C. The above deliverables were completed in accordance with this protocol and any modifications or special requirements in the *Inspector*'s Contract with the City.
D. The PACP database will be checked by WinCan's PACP validator tool and any errors will be returned to the *Inspector* for correction.
E. The *Inspector*'s asset UNITIDs match the City's asset UNITIDs and meet nomenclature requirements of this protocol.
F. The *Inspector's* Cable Footage Counter Calibration Log demonstrates that inspections were performed when the Cable Footage Counter was calibrated per the requirements of Section 3.4.5 CCTV Equipment. The City reserves the right to reject any work and pay application if inspection(s) were completed with a Cable Footage Counter that was not calibrated or that had an accuracy outside of compliance of Section 3.4.5 CCTV Equipment requirements.

4.3.3.2 Quality Review Form

A. The City will develop a Quality Review Form (QRF) with comment outlining potential errors and return the QRF to the *Inspector*.
B. The *Inspector* shall respond to all QRF comments explaining why the data is correct and/or resubmit the entire data deliverable within fourteen (14) calendar days of receiving the QRF.
C. Partial resubmittals of the data deliverable will NOT be accepted.

5.0 DELIVERABLES

5.1 General

A. Specific details regarding additional required deliverables and frequency of submittals for sewer inspections shall be included in the project's Contract Documents.

B. *Inspector* shall maintain copies of all deliverables for the duration of the project and for a minimum of three (3) years after project closeout.

5.2 Final Deliverable

A. City will provide WinCan Web access to the *Inspector*.

B. *Inspector* shall upload the final PACP compliant database and associated videos/photos to a WinCan Web server.

C. In addition to the WinCan web upload, *Inspector* shall deliver the following information in electronic format via a transportable hard drive:

i. PACP Access Database
   a. CCTV Video (linked to Access Database)
   b. Feature/Defect Photographs (linked to Access Database)

ii. PACP Pipe Run, Scoring, and Feature/Defect Photograph Reports

iii. Data Files and Reports for SONAR, LASER, LIDAR, Rebound Hammer Test, PPR

iv. Project Summary Report

v. Could Not Open (CNO) List

vi. Could Not Locate (CNL) List

vii. Map Change Forms (tabular summary and schematics, as required)

5.3 Project Status Reports

A. The frequency for submittal of Project Status Reports shall be defined in the project Contract Documents.

B. At a minimum the following information shall be included in Project Status Reports:

i. Could Not Open (CNO) List (if applicable)

ii. CNOs

iii. Could Not Locate (CNL) List (if applicable)

iv. CNLs

v. Could Not Access (CNA) List (if applicable)

vi. CNAs

vii. Clearing Request Map(s)

viii. Cable Footage Counter Calibration Log
ix. Rebound Hammer Calibration Log (if applicable)
x. Schedule

5.4 PACP Access Database

5.4.1 Technical

The PACP Access Database shall be written in Version 7. The video and photo reference location/path shall be limited to one single folder named 'Video' and 'Picture', respectively.

5.4.2 Header

All header fields shall be completed using the PACP abbreviations and units as defined in NASSCO PACP Version 7. The PACP Access Database shall include, at a minimum, all the PACP mandatory header fields, all non-mandatory header fields that are applicable to the asset or work, and the following non-mandatory and/or City-specific changes to the PACP header fields:

A. Field 1 – Name of the *Inspector*'s Company in a format agreed upon with the City. (Note, this is different than the Field 1 requirement in NASSCO)
B. Field 7 – P/O Number. Defined as the *Inspector's* contract number assigned by the City in four(4)-digit format.
C. Field 8 – Work Order Number. Work order number or inspection number if assigned by the CITY.
D. Field 14 – Weather
E. Field 20 – Inspection Technology Used
F. Field 25 – Pipe Segment Reference (Upstream Access Point UNITID_ Downstream Access Point UNITID)
G. Field 35 – Lining Method, if applicable.
H. Field 38 – Total Length (Anticipated Length from City GIS). Note, this field is only to be completed in the event of an MSA or partial survey.
I. Field 39 – Length Surveyed

5.4.3 Inspection Form

The CCTV inspection form within the PACP access database shall be completed in accordance with NASSCO requirements and include the following additions:

A. The 'VCR Time' or 'Video Time' shall be included at the appropriate time in the CCTV video that represents the defect or feature code.
B. The remarks column shall be used identify Drop Connections, Diversion Structures, Lamp Holes, Grit Chambers, etc.

5.5 PACP Pipe Run, Scoring, and Feature/Defect Photograph Reports

Inspector shall provide a PACP Report for each pipe segment in PDF that contains:

A. Pipe run information pursuant to Sections 5.4.2 Header and 5.4.3 Inspection Form
B. Structural, Operation and Maintenance, and Overall Quick/Pipe/Index ratings and total ratings for each grade.
C. Feature/defect photographs

5.6 CCTV Video

A. One (1) electronic video, in MP4 file format, shall be submitted for each pipe segment inspected.
B. The opening frame of each video shall display at a minimum the following information:
    i. Inspection date
    ii. Inspection time
    iii. Weather, PACP Field 14 – Weather
    iv. Pipe Segment Reference
    v. Upstream Access Point UNIT ID
    vi. Downstream Access Point UNITID
    vii. Direction of inspection
        a. "D" shall indicate "downstream" inspection direction. Downstream direction indicates that inspection was performed from upstream access point structure to downstream access point structure.
        b. "U" shall indicate "upstream" inspection direction. Downstream direction indicates that inspection was performed from downstream access point structure to upstream access point structure.
    viii. Pipe Height, PACP Field 31 – Height (Diameter for circular pipes)
    ix. Pipe Width, PACP Field 32 – Width (leave blank for circular pipes)
    x. Pipe Shape, PACP Field 33 – Shape
    xi. Pipe Material, PACP Field 34 – Material
C. The following minimum information shall be continually displayed throughout the entirety of the video recording:

i. Inspection date
ii. Inspection time
iii. Running Footage - current inspection distance relative to the starting position
iv. Upstream Access Point UNITID
v. Downstream Access Point UNITID
vi. Direction of inspection

D. Each video file shall be named using the upstream to downstream unique asset identifiers (UNITID), underscore date stamp, and underscore inspection direction.
   i. UNITID for the upstream and downstream access points shall be per Section 3.8.1 Unique Identifier Naming Convention for Point Feature Assets.
   ii. The date stamp shall be presented as four (4)-digit year, followed by two (2)-digit month, followed by two (2)- digit day: "YYYYMMDD".
   iii. "D" shall indicate "downstream" inspection direction.
   iv. "U" shall indicate "upstream" inspection direction.
   v. For example, the video file for the pipe segment from manhole S023-314 to manhole S023-317 inspected upstream to downstream would be named: "S023-314_S023-317_YYYYMMDD_D"

5.7 Data Files and Reports for SONAR, LASER, LIDAR, Rebound Hammer Test, PPR

A. If applicable, SONAR, LASER, LIDAR, Rebound Hammer Test, and/or PPR data files and reports shall be provided for each pipe segment inspected.
B. Each file shall be named using the upstream to downstream unique asset identifiers, underscore date stamp, and underscore inspection direction.
   i. Unique asset identifiers of the upstream and downstream access points shall be Section 3.8.1 Unique Identifier Naming Convention for Point Feature Assets.
   ii. The date stamp shall be presented as four (4)-digit year, followed by two (2)-digit month, followed by two (2)- digit day: "YYYYMMDD".
   iii. "D" shall indicate "downstream" inspection direction.
   iv. "U" shall indicate "upstream" inspection direction.
   v. For example, the video file for the pipe segment from manhole S023-314 to manhole S023-317 inspected from upstream to downstream would be named: "S023-314_S023-317_YYYYMMDD_D"

5.8 Feature/Defect Photographs

Digital photographs shall be provided for each structural defect, operation and maintenance defect, I/I source, construction feature, and miscellaneous feature.

A. Photographs shall be in JPEG file format.
    i. The following minimum information shall be displayed on each photo:
        a. Inspection date
        b. Inspection time
        c. Running Footage - current inspection distance relative to the starting position
        d. Upstream Access Point UNITID
        e. Downstream Access Point UNITID
        f. Direction of inspection
        g. Defect Code
B. Each photograph file shall be named using the associated video file name, associated PACP defect code, and three (3)-digit linear footage at which the defect was observed in the pipe segment inspection.
    i. For example, a photograph taken on March 25, 2015, of a Hole Soil Visible defect, 75 linear feet upstream against the direction of flow (reverse set-up), in a pipe segment located south of the Missouri River on atlas map 24 between manholes 500 (upstream manhole) and 498 (downstream manhole), then the photograph file would be named: "S024-500_S024-498_20150325_U_HSV_075"

5.9 Project Summary Report

The Project Summary Report is a tabular summary of the project.

A. The Project Summary Report shall be submitted in .xlsx or .csv file format.
B. At a minimum the Project Summary Report shall include the following fields, organized by pipe segment inspected:
    i. Inspection date
    ii. Upstream Access Point (UNITID)
    iii. Downstream Access Point (UNITID)
    iv. Work Order Number (if provided by CITY)
    v. Pipe Height, PACP Field 31 – Height (Diameter for circular pipes)
    vi. Pipe Width, PACP Field 32 – Width (leave blank for non-circular)
    vii. Pipe Shape, PACP Field 33 – Shape

viii. Pipe Material, PACP Field 34 – Material
ix. Total Length – Length of pipe segment as measured in GIS based on X & Y coordinates
x. Length Surveyed – Total length inspected as measured by Cable Footage Counter
xi. Inspection Completion Status – Full, Partial, or Unable to Complete. (Any "Partial" inspections or "Unable to Complete" require a reason documented in the "Significant Issue Description" Field.)
xii. Structural Quick Rating (QSR)
xiii. Operations & Maintenance Quick Rating (QMR)
xiv. Overall Quick Rating (QOR)
xv. Cleaning performed (i.e. Light Cleaning, Heavy Cleaning, Mechanical Cleaning)
xvi. Volume of debris removed in cubic yards
xvii. Time spent heavy cleaning in hours (or other units as defined in the Contract Documents)
xviii. Time spent mechanical cleaning in hours (or other units as defined in the Contract Documents)
xix. Significant Issue Description (Examples include: Reason for reverse set-up, Miscellaneous Survey Abandoned (MSA) and reason for not completing the pipe inspection, notations such as manhole is buried, requires clearing for access, private property could not be accessed, etc.)

5.10 Could Not Open (CNO) List

A. If applicable, City will provide a list of access points that were unable to be opened (CNO List) during system characterization to the *Inspector*.
B. From this CNO List, *Inspector* shall provide an updated tabular summary of access points in xlsx or csv file format, updating the Status Designation of the access point based on the circumstance observed by the *Inspector* at the time of pipe inspection.
C. CNO List shall include the following fields:
   i. Access Point UNITID
   ii. Status Designation from System Characterization (if applicable)
   iii. Opening Issue Description from System Characterization (if applicable)
   iv. Status Designation assigned by *Inspector* (during CCTV)
   v. COORD_X (in State Plane Coordinate System Missouri West 2403, feet)
   vi. COORD_Y (in State Plane Coordinate System Missouri West 2403, feet)
   vii. What the access point is Buried Under (for CNO - Buried ONLY)
      a. N/A (Not applicable, CNO - Seized)

b. Pavement
c. Debris/Earthen Materials

viii. Buried Depth in inches (for Buried Under debris/earthen materials ONLY)
ix. Comments (as necessary)

5.11 Could Not Locate (CNL) List

A. If applicable, City will provide a list of access points that were unable to be located (CNL List) during system characterization to the *Inspector*.
B. *Inspector* shall provide an updated tabular summary of access points in xlsx or csv file format, , updating the Status Designation of the access point based on the circumstance observed by the *Inspector* at the time of pipe inspection.
C. CNL L shall include the following fields:
   i. Access Point UNITID
   ii. Status Designation assigned by *Inspector* (during CCTV)
   iii. COORD_X (in State Plane Coordinate System Missouri West 2403, feet)
   iv. COORD_Y (in State Plane Coordinate System Missouri West 2403, feet)
   v. Comments (as necessary)

5.12 Could Not Access (CNA) List

A. If applicable, City will provide a list of access points that were unable to be accessed (CNA List) during system characterization to the *Inspector*.
B. From this CNA List, *Inspector* shall provide an updated tabular summary of access points in xlsx or csv file format, updating the Status Designation of the access point based on the circumstance observed by the *Inspector* at the time of pipe inspection.
C. The CNA List shall include the following fields:
   i. Access Point UNITID
   ii. Status Designation from System Characterization (if applicable)
   iii. Access Issue Description from System Characterization (if applicable)
   iv. Status Designation assigned by *Inspector* (during CCTV)
   v. Access Issue Description assigned by *Inspector* (during CCTV)
   vi. Clearing Requested (Yes/No)
   vii. Clearing Request Map file name per Section 5.13 Clearing Request Map(s) (Note: If no clearing is requested, file name shall indicate “None”)

5.13 Clearing Request Map(s)

A. *Inspector* shall submit a Clearing Request Map for each clearing request identified:
   i. in the CNA List (see Section 5.12 Could Not Access (CNA) List).
   ii. in Project Summary Report significant issue description (see Section 5.9 Project Summary Report)
B. Each Clearing Request Map shall be submitted as an electronic PDF file with a sheet size of 8.5x11 inches.
C. Each Clearing Request Map shall have a file name with UNITID, underscore, "ClearingRequest". (For example, if manhole S024-411 could not be accessed due to clearing issues and clearing is requested, the Clearing Request Map file shall be named: "S024-411_ClearingRequest").
D. At a minimum, each Clearing Request Map shall include the following:
   i. City GIS base file
   ii. Aerial photography base file
   iii. North Arrow
   iv. Scale Bar
   v. Legend
   vi. Access points labeled with UNITID and symbology by access point type (Inlet, Manhole, or Other)
   vii. CNA access point for which clearing is being requested clearly identified from other access points in viewport
   viii. Proposed clearing extents and area in square feet

5.14 Map Change Forms

Map Change Forms shall be used to identify locations where field observations differ from the City GIS. The following types of map change forms should be utilized depending on the situation.

5.14.1 New Structure

Inspector shall provide a tabular summary (see Attachment 4) of access points not displayed in the City GIS in xlsx or csv file format that includes the following fields:

A. Temporary UNITID assigned by the *Inspector* (during CCTV)
B. COORD_X (in State Plane Coordinate System Missouri West 2403, feet)
C. COORD_Y (in State Plane Coordinate System Missouri West 2403, feet)
D. Structure Type

i. Manhole
ii. Inlet
iii. Other (Please clarify in "Comments" field)

E. Original Pipe Segment Reference
F. Revised Upstream Pipe Segment Reference (format for pipe segment reference is UpstreamUNITID_DownstreamUNITID)
G. Revised Downstream Pipe Segment Reference (format for pipe segment reference is UpstreamUNITID_DownstreamUNITID)
H. Permanent UNITID assigned by KC Water
I. Comments (as necessary)

5.14.2 Change in Structure Type

Inspector shall provide a tabular summary (see Attachment 4) of access points that are displayed as with an incorrect structure type in the City GIS in xlsx or csv file format that includes the following fields:

A. Original UNITID assigned in the City GIS
B. Original Structure Type
   i. Manhole
   ii. Inlet
   iii. Other (Please clarify in "Comments" field, e.g. fitting)
C. Comments (as necessary)

5.14.3 Flow Direction Change

Inspector shall provide a tabular summary (see Attachment 4) of assets that are displayed with an incorrect flow direction in the City GIS in xlsx or csv file format that includes the following fields:

A. Original Pipe Segment Reference (format for pipe segment reference is UpstreamUNITID_DownstreamUNITID)
B. Revised Pipe Segment Reference (format for pipe segment reference is UpstreamUNITID_DownstreamUNITID)
C. Comments (as necessary)

5.14.4 Does Not Exist (DNE)

Inspector shall provide a tabular summary (see Attachment 4) of assets that do not exist as confirmed by subsurface pipe inspection in xlsx or csv file format that includes the following fields:

A. UNITID as assigned in the City GIS
B. Comments (as necessary)

5.14.5 Miscellaneous

A. *Inspector* shall provide a schematic in PDF with a sheet size of 8.5x11 inches for assets that are affected by field-observed connectivity issues and/or are not applicable for the other four (4) map change forms (Sections 5.14.1 New Structure, 5.14.2 Change in Structure Type, 5.14.3 Flow Direction Change, and 5.14.4 Does Not Exist (DNE) .
B. Each Map Change Form schematic shall have a file name of the Revised Pipe Segment Reference.
C. The schematic shall at a minimum include the following:
    i. Original Pipe Segment Reference
    ii. Revised Pipe Segment Reference
    iii. Two (2) Viewports
        a. Original GIS features
        b. Revised GIS features
    iv. Aerial photography
    v. North Arrow
    vi. Scale Bar
    vii. Legend
    viii. Pipe Flow Direction Arrows
D. *Inspector* shall provide a tabular summary (see Attachment 4) of assets that are affected by field-observed connectivity issues and/or are not applicable for the other four (4) map change forms (Sections 5.14.1 New Structure, 5.14.2 Change in Structure Type, 5.14.3 Flow Direction Change, and 5.14.4 Does Not Exist (DNE) in xlsx or csv file format that includes the following fields:
    i. Original Pipe Segment Reference (format for pipe segment reference is UpstreamUNITID_DownstreamUNITID)
    ii. Revised Pipe Segment Reference (format for pipe segment reference is UpstreamUNITID_DownstreamUNITID)
    iii. Map Change Form Schematic File Name
    iv. Comments

5.15 Cable Footage Counter Calibration Log

A. Cable footage counter calibrations shall be performed in accordance with Section 3.4.5 CCTV Equipment.

B. *Inspector* shall submit a Cable Footage Counter Calibration Log, which at a minimum, shall include the following:
   i. Calibration Date
   ii. Pre-Measured Length in feet
   iii. Recorded Cable Footage Length in feet
   iv. Difference between Recorded Cable Footage Length and Pre-Measured Length (Cable Footage Length minus Pre-Measured Length)
   v. Percent Difference between Recorded Cable Footage Length and Pre-Measured Length (Difference between Recorded Cable Footage Length and Pre-Measured Length divided by Pre-Measured Length, expressed as percentage)

5.16 Rebound Hammer Calibration Log

A. Rebound Hammer calibrations shall be performed in accordance with manufacturer requirements.
B. *Inspector* shall submit a Rebound Hammer Calibration Log , which at a minimum shall include the following:
   i. Calibration Date
   ii. Manufacturer Calibration Requirements (i.e. specification, brochure, product literature, etc.)
   iii. Certification of Calibration (if not performed by *Inspector*)

5.17 Schedule

Inspector shall provide a schedule of work complete and anticipated date of final deliverable in a format desirable to the City.

ATTACHMENT 1 - COULD NOT OPEN (CNO) LIST TEMPLATE

Could Not Open (CNO) List								
UNITID	System Characterization Status Designation	System Characterization Opening Issue Description	CCTV Status Designation*	COORD_X**	COORD_Y**	Buried Under	Buried Depth (inches)	Comments

* If "CNO - Buried" include Buried Under Surface Type and Buried Depth

** X & Y coordinates in State Plane Coordinate System Missouri West 2403 (feet)

Instructions:

CCTV contractor populate/update values in columns with yellow heading

ATTACHMENT 2 – COULD NOT LOCATE (CNL) LIST TEMPLATE

Could Not Locate (CNL) List				
UNITID	CCTV Status Designation	COORD_X*	COORD_Y*	Comments

*X & Y coordinates in State Plane Coordinate System Missouri West 2403 (feet)

Instructions:

CCTV contractor populate/update values in columns with yellow heading

ATTACHMENT 3 – COULD NOT ACCESS (CNA) LIST TEMPLATE

Could Not Access (CNA) List								
UNITID	System Characterization Status Designation	System Characterization Access Issue Description	CCTV Status Designation	CCTV Access Issue Description	COORD_X*	COORD_Y*	Clearing Requested?	Clearing Request Map File Name

*X & Y coordinates in State Plane Coordinate System Missouri West 2403 (feet)

Instructions:

CCTV contractor populate/update values in columns with yellow heading

ATTACHMENT 4 - MAP CHANGE FORM TEMPLATES

Map Change Form: New Structure								
Inspection Temporary UNITID	COORD_X*	COORD_Y*	Structure Type	Original Pipe Segment Reference**	Revised Upstream Pipe Segment Reference**	Revised Downstream Pipe Segment Reference**	KC Water Permanent UNITID	Comments

*X & Y coordinates State Plane Coordinate System Missouri West 2403 (feet)

**Pipe Segment Reference = UpstreamUNITID_DownstreamUNITID (e.g. S100-101_S100-102)

Map Change Form: Structure Type				
Original UNITID	Original Structure Type	Revised Structure Type	KC Water Permanent UNITID	Comments

Map Change Form: Flow Direction		
Original Pipe Segment Reference*	Revised Pipe Segment Reference*	Comments

*Pipe Segment Reference = UpstreamUNITID_DownstreamUNITID (e.g. S100-101_S100-102)

Map Change Form: Does Not Exist (DNE)	
UNITID	Comments

Map Change Form: Miscellaneous			
Original Pipe Segment Reference*	Revised Pipe Segment Reference*	Map Change Form Schematic File Name	Comments

*Pipe Segment Reference = UpstreamUNITID_DownstreamUNITID (e.g. S100-101_S100-102)

ATTACHMENT 5 - NASSCO PACP QUALITY CONTROL

NASSCO PACP Quality Control

Sewer defect coding has become of paramount importance for the worldwide sewer rehabilitation industry to ascertain critical information regarding the underground infrastructure. NASSCO PACP has enabled the wastewater industry to provide standardization and consistency in the way we evaluate sewer pipe condition and how we manage TV inspection results. The decisions made by engineers are based on the data collected and the accuracy and quality of this data is essential in making rehabilitation decisions for wastewater collection systems. The need for Quality Control of PACP data is essential and the procedure should be easy to apply and even easier to audit.

CCTV contracting companies should have a Random Number Quality Control procedure in place that is then audited by the client. A random number is one of a series of numbers that have no detectable pattern, so that each and every item in a known population has an equal chance of being selected based upon the random number. The client can carry out their own QC but it must be based upon the Random Sampling system, so that discrepancies about the method of choice of the inspections to be Quality Controlled disappear. The intent is for the client to actually audit the CCTV contractors QC procedure rather than performing their own QC. If there is doubt about the results then the Client can ask for another differing set of Random Numbers to be created and be applied to the CCTV operator in question, thereby generating another different set of inspections to be checked. A QC history must be created for each CCTV operator and not created for each contract.

General Method

Unbiased selection of inspections that require checking is the backbone of any QC procedure. First it has to be decided the percentage of the inspections that need to be checked. I am proposing that NASSCO require a minimum of 5% of a CCTV operator's data be checked.

Population

A population is needed to account for the number of inspections for each CCTV operator from which the 5% is derived. The method would be based on the approximate number of inspections performed each year by a CCTV operator, calculated as follow:

1400' per day at 200' per inspection = 7 inspections per day
240 active work days per year = 240 days
Population = 1680 inspections per year, per CCTV operator

5% to be checked = 84 inspections

It does not matter whether the population is actually higher or lower than this as once the Random Numbers have run out then a new set is generated or the population equates to 1.5 years as opposed to 1 year. The result is still 5% being checked.

Generating the Random Numbers
A Random Number list, based upon the population and the selection percentage, is available from many web sites. The site we will use for this paper is: www.randomizer.org/form.htm. This site generates a list of random numbers that can be sorted in numerical order and printed. Each CCTV operator must have a different set of Random Numbers.

Selection of inspections to be checked
In the field the CCTV operator inspects each sewer segment and either types the PACP information into a computer database or manually writes the information on PACP forms for each sewer segment in the order the sewer segments are inspected. In the office, the QC employee / operator counts through the inspections, for each separate CCTV operator, in the order in which they were inspected. When an inspection coincides with a Random Number a copy of the inspection is made from the video tape/CD/DVD onto the CCTV operators master QC video tape/CD/DVD. A copy of the corresponding CCTV report is also printed from the computer. These are then kept in the CCTV operators QC folder until the QC is carried out by a qualified QC employee / operator. By using the Random Number sampling system a CCTV operator will not be able to "abuse" the system. The client can ask for the set of Random Numbers for each CCTV operator at the start of a project, or the client can provide a set of Random Numbers to be used for each operator associated with the project.

Quality Control of an Inspection
It is expected that the accuracy of the Header record exceed 90% as most of the field contents are based upon facts. The simplest method for QC of the Header record is as follows:
Each field completed, and those that are not but should have been, is counted, producing a "number of fields checked", say 32 (ignoring such fields as Cover and Invert levels and other unused fields)
Then the fields with mistakes are counted, irrelevant of the level of the mistake, creating an "error count" say for this example, 2.
Therefore the calculation is:

(error count / number of fields checked) * 100 = percentage error
100 – error percentage = accuracy percentage

(2 / 32) * 100 = 6.25%
100 – 6.25 = 93.75% accuracy level

This percentage accuracy level is then entered onto a graph so that ongoing accuracy can easily be seen, again, for each CCTV operator.

Detail Information
As with the Header records, each field that has been completed in the Detail records is added up, irrelevant of whether it is a Clock At/To, the Continuous Defect field or Distance/Video digits. Each entry is treated as equally important. From this number of

entries made in the Detail section a figure is arrived. A qualified QC employee/operator then looks through the same inspection and checks the accuracy of each field and reaches two values, the number of entries that should have been made and an error count. No attempt should be made to create a new inspection from scratch, just check what has already been reported on. If a defect is not recorded then the number of fields that support the missed defect is added to the Error Count, for instance, if the CCTV operator misses an EMJ then the error count increases by at least 5 errors:

The Video Digit, Distance, Code, Clock At and To and the %

The 5 errors must also be added to the number of entries that should have been made as well as any other errors to reach a total number of entries. Therefore at the end each inspection there are two values, the number of entries that should have been made and the error count. The calculation for the Quality Control of each inspection is as follows:

(Error Count / Number of entries that should have been made) * 100 = Percentage Error
100 – Percentage Error = Accuracy Level

Assume that the number of entries made should have been 122
Assume that the Error Count is 8

(8 / 122) * 100 = 6.5%
100% - 6.5 = 93.5% Accuracy Level

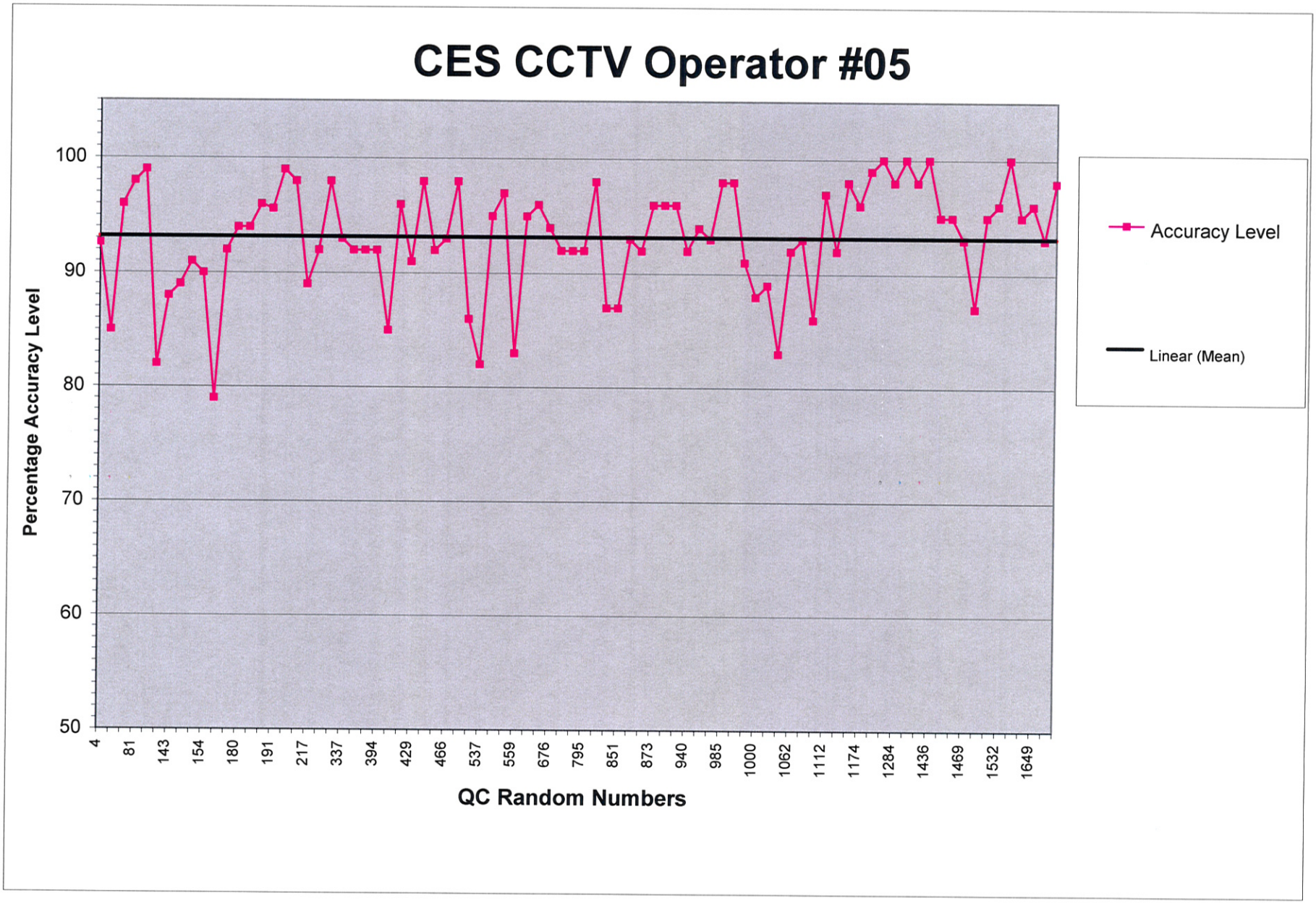
This percentage Accuracy Level is then entered onto a graph so that ongoing level can be easily seen for each CCTV Operator.

Summary
All QC inspection information for each sewer segment checked is entered into QC forms so that an Audit trail can be established. There must be hard copies of each inspection checked with the Errors and Omissions clearly marked. The Accuracy Level calculations must also be entered into the QC logs. The Random Number must be entered against each aspect of the QC procedure. A continuing Accuracy Level Graph must be kept up to date for each CCTV Operator; it is acknowledged that the results could be as much as one month behind the time of the inspection.

Research Randomizer Results:
1 Set of 84 Unique Numbers Per Set
Range: From 1 to 1680 -- Sorted
Set 1

	Random Numbers	Accuracy Level
1	4	92.6
2	34	85
3	73	96
4	81	98
5	105	99
6	108	82
7	143	88
8	146	89
9	147	91
10	154	90
11	162	79
12	163	92
13	180	94
14	181	94
15	187	96
16	191	95.6
17	209	99
18	214	98
19	217	89
20	223	92
21	321	98
22	337	93
23	345	92
24	369	92
25	394	92
26	396	85
27	422	96
28	429	91
29	433	98
30	439	92
31	466	93
32	498	98
33	511	86
34	537	82
35	545	95
36	550	97
37	559	83
38	617	95
39	664	96
40	676	94
41	679	92
42	710	92
43	795	92
44	816	98
45	838	87
46	851	87

47	869	93
48	872	92
49	873	96
50	883	96
51	908	96
52	940	92
53	954	94
54	963	93
55	985	98
56	987	98
57	988	91
58	1000	88
59	1001	89
60	1003	83
61	1062	92
62	1074	93
63	1102	86
64	1112	97
65	1131	92
66	1168	98
67	1174	96
68	1177	99
69	1261	100
70	1284	98
71	1414	100
72	1422	98
73	1436	100
74	1441	95
75	1446	95
76	1469	93
77	1472	87
78	1519	95
79	1532	96
80	1571	100
81	1619	95
82	1649	96
83	1666	93
84	1672	98


CES CCTV Operator #05
Percentage Accuracy Level
100
90
80
70
60
50
4
81
143
154
180
191
217
337
394
429
466
537
559
676
795
851
873
940
985
1000
1062
1112
1174
1284
1436
1469
1532
1649
QC Random Numbers
Accuracy Level
Linear (Mean)

Research Randomizer

RR Home Page
Tutorial
Contact Us
About Research Randomizer
Social Psychology Network

To generate a set of random numbers, simply enter your selections (integer values only):

How many sets of numbers do you want to generate? 1 Help

How many numbers per set? 84 Help

Number range (e.g., 1-50): From: 1 To: 1680 Help

Do you wish each number in a set to remain unique? Yes Help

Do you wish to sort your outputted numbers? Yes: Least to Greatest Help

How do you wish to view your outputted numbers? Place Markers Off Help

Randomize Now!

Note: Research Randomizer may not work with AOL browsers or Netscape 6.x. Also, you may need to disable any pop-up ad blockers you are running because your random numbers will be displayed in a pop-up window (just configure your pop-up blocker to exclude this site.)

Instructions

To generate a set of random numbers, simply fill out the form, indicating:

- ✔ How many sets of random numbers you would like
- ✔ How many numbers you want in each set
- ✔ The range within which you want your numbers to fall
- ✔ Whether or not you want each number in a set to be unique
- ✔ Whether you would like the numbers in each set sorted, either from Least to Greatest or from Greatest to Least
- ✔ How you wish to view your outputted numbers

RESEARCH RANDOMIZER

Close
For best results, close this window after each use.

Print

Download in Excel

Research Randomizer Results

1 Set of 84 Unique Numbers Per Set
Range: From 1 to 1680 -- Sorted from Least to Greatest

Job Status: **Finished**

Set #1:

58, 88, 98, 149, 161, 223, 235, 282, 339, 361, 368, 399, 410, 411, 436, 442, 487, 495, 498, 508, 590, 591, 618, 627, 645, 648, 681, 685, 698, 707, 728, 753, 772, 779, 839, 852, 878, 883, 897, 909, 929, 933, 950, 987, 991, 1006, 1012, 1040, 1058, 1067, 1098, 1102, 1114, 1143, 1151, 1203, 1219, 1225, 1240, 1243, 1256, 1269, 1323, 1342, 1362, 1395, 1398, 1431, 1484, 1486, 1498, 1507, 1524, 1529, 1555, 1556, 1577, 1579, 1609, 1622, 1627, 1628, 1656, 1661

ATTACHMENT K

02676 - SEWER LINE CLEANING SPECIFICATION

SECTION 02676 - SEWER LINE CLEANING

PART 1 - GENERAL

All sewer pipe and manholes along the section of sewer line indicated on the drawings shall be cleaned as described herein.

1.01 SCOPE.

This section covers sewer line cleaning. The Contractor shall provide all materials, labor, and equipment necessary to complete all sewer pipe cleaning and to remove all accumulated grease, sand, grit, solids, and debris from the sewer in accordance with the specifications and to the complete satisfaction of the Owner and the Engineer.

Contractor shall locate and make all existing manhole and diversion structure access points open and accessible for the work.

1.02 DESCRIPTION.

Cleaning shall be described as the removal of materials and debris from the sewer line, manholes, and diversion structures, and restoration of the sewer line to a minimum of 95 percent of the original carrying capacity. This does not include the removal of hard deposits such as minerals and cast iron scale.

1.03 RELATED SECTIONS

1.04 CODES AND STANDARDS. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

1.05 CONTRACTOR SUBMITTALS.

Complete details and specifications covering cleaning procedures, modifications, and equipment shall be submitted in accordance with the procedure set forth in the submittals section.

A. Shop Drawings

B. Product Data

C. Test Reports

D. Certificates

1.06 QUALITY ASSURANCE

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING.

PART 2 - PRODUCTS

2.01 EQUIPMENT.

The equipment selected for cleaning shall be capable of removing all dirt, grease, rock, brick, wood, sand, mud, and other deleterious materials and obstructions from the sewer line. Cleaning shall be performed using hydraulically-propelled, high-velocity and/or mechanically-powered sewer cleaning equipment and vacuum removal equipment.

Contractor shall employ only experienced personnel who are familiar with, and regularly engaged in, the type of work required; shall provide adequate supervision by a qualified supervisor at all times when cleaning is in progress; and shall have access to equipment or proper size and capacity to perform the work as specified herein.

2.02 HYDRAULICALLY-POWERED EQUIPMENT.

The equipment used shall be of a movable dam type and be constructed in such a way that a portion of the dam may be collapsed at any time during the cleaning operation to protect against flooding of the sewer or bypassing to waterways. The movable dam shall be equal in diameter to the pipe being cleaned and shall provide a flexible scraper around the outer periphery to ensure removal of grease. If sewer cleaning balls or other equipment which cannot be collapsed are used, special precautions shall be taken that are acceptable to the Owner, to prevent flooding or bypassing of sewers and public property.

2.03 HIGH-VELOCITY EQUIPMENT.

All high-velocity sewer cleaning equipment shall be constructed for ease and safety of operation. The equipment shall have a minimum of 700 feet of one inch minimum diameter hose with working pressure ratings to match the rating of the water pressure. The equipment shall have a selection of two or more high-velocity nozzles. The nozzles shall be capable of producing a scouring action from 10 degrees to 45 degrees in all sizes of sewer lines included in this Contract using a minimum volume of 60 gallons of water per minute, at a minimum working pressure of 2,000 pounds per square inch.

Equipment shall also include a high-velocity gun for washing and scouring the manholes and diversion structure walls, channels, shelves, floors, and manhole covers and frames from grade level. The gun shall be capable of producing flows from a fine spray to a solid stream. The equipment shall carry its own water tank, auxiliary engines, pumps, and hydraulically-driven hose reel. Filler piping on the tank shall have an air gap to prevent backflow and contamination of the water supply system.

Multiple passes (one to three passes) with the water jet shall be made, as required, to flush the debris to the manhole in order to remove the debris. Sewers will be cleaned by introducing the water jet into the sewer line facing against the sewer flow and retrieving the water jet under pressure with the sewer flow. The nozzle shall not be stopped in the sewer line when under working pressure, but shall continue to move through the line at all times.

2.04 MECHANICALLY-POWERED EQUIPMENT.

Bucket machines shall be in pairs with sufficient power to perform the work in an efficient manner. Machines shall be belt operated or have an overload device. Machines with direct drive that could cause damage to the pipe will not be allowed. A power rodding machine shall be either a sectional or continuous rod type. To ensure safe operation, the machine shall be fully enclosed and have an automatic safety clutch or relief valve.

PART 3 - EXECUTION

It is the responsibility of the Contractor to properly apply for, secure, and provide for all water needed to perform the work described.

Precautions shall be taken to protect the sanitary sewer structures from damage that may result from improper use of the cleaning equipment.

Contractor is responsible for traffic control, as needed; in addition to Contractor's truck warning lights and traffic cones, as needed or required. Traffic control is subject to review and approval by the Owner.

If successful cleaning cannot be performed without risk of damage to the pipe, or if the equipment fails to traverse the entire line segment, cleaning efforts shall be temporarily suspended, and the Owner shall be notified. The line segment shall then be evaluated in order to determine if the segment can be adequately cleaned. Any unusual conditions found during the cleaning operations shall be reported to the Owner as soon as possible.

3.01 MANHOLE MODIFICATIONS.

Any modifications to manholes to facilitate cleaning shall be the Contractor's responsibility and shall be subject to approval by Owner.

Contractor shall salvage and reuse all manhole covers and rings that are removed during sewer line and manhole rehabilitation, unless otherwise directed by Engineer.

3.02 ROOT REMOVAL.

All roots shall be removed. Special attention shall be given during the cleaning operation to assure complete removal of roots from the joints. Procedures may include the use of mechanical equipment such as rodding machines, bucket machines and winches using root cutters and porcupines, and equipment such as high-velocity jet cleaners. Chemical root treatment may be used at the option of the Contractor.

When chemicals are used to aid in the removal of roots, the chemical shall be EPA registered and labeled for use in sewer lines and acceptable to all applicable State and City agencies. All material and mixing/application procedures for chemical root treatment shall be consistent with the latest standards, requirements, and recommendations of the manufacturer of the chemical root treatment material used.

3.03 DEBRIS REMOVAL.

All sludge, dirt, sand, grit, rocks, bricks, wood, mud, grease, and any other solid or semi-solid material resulting from the cleaning operation shall be removed using vacuum removal equipment or other methods to assure debris does not cause downstream obstruction. Vacuum equipment shall be suitable for removal of all debris at each manhole location for each line being cleaned. Vacuum system performance will be at least 4,000 CFM and 16" Hg vacuum pressure to ensure all debris can be efficiently removed from the sewer.

A device designed to minimize debris from escaping down the sewer line, the design and use of which is subject to approval by Owner, shall be used in all sewer line cleaning operations. When hydraulic cleaning equipment is used, a suitable sand trap, weir, basket, or dam shall be constructed in the downstream manhole in such a manner that the solids will be trapped while using a rake or sewer shovel to help collect solids.

Material or debris removed from the sewer shall be immediately placed in watertight containers. Containers may include valved drains to remove excess water from containers.

Drainage, including rainfall, shall be contained and returned to the sewer by means acceptable to the Owner.

3.04 DEBRIS DISPOSAL.

All debris removed from the sewer shall be legally disposed of by and at the expense of the Contractor. The disposal facility shall be a permitted landfill. The debris shall be dewatered and suitable for immediate disposal prior to weighing at the landfill. Contractor shall provide the Engineer with scale tickets to verify quantities of debris disposed of in an approved landfill.

Transportation of debris or other material by the Contractor shall be done in vehicles or equipment which contain the debris or other material in such a manner to minimize objectionable odor and avoid the possibility of dripping, spilling, scattering, leaking, or blowing. Should mishaps occur for any reason, the Contractor shall be responsible for cleaning up any debris or other material to the satisfaction of the Owner or other authorities having jurisdiction. All vehicles transporting debris or other material shall not exceed the maximum allowable load limits of any road being used.

3.05 CLEANING PRECAUTIONS.

During sewer cleaning operations, satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools, which depend on water pressure to provide their cleaning force, or tools which retard flow in the sewer line are used, precautions shall be taken to ensure that the water pressure created does not damage or cause flooding to public or private property being served by the sewer being cleaned or does not cause bypassing of flow to nearby waterways.

The flow of wastewater in the sewers shall be utilized to provide necessary pressures of hydraulic cleaning devices whenever possible. When additional water is required from other sources to avoid delay in normal work procedures, the water shall be conserved and not used unnecessarily. No fire hydrant shall be obstructed in case of fire in the area served by the hydrant.

The Contractor shall be responsible for all damage to public and private property as a result of all cleaning operations. The cost of restoring any damaged area to conditions prior to cleaning shall be borne by the Contractor at no additional cost to the Owner.

3.06 PUMPING AND BYPASSING.

When pumping and bypassing is required, Contractor shall supply the pumps, piping, and other equipment necessary to divert the flow of wastewater around the sewer section being cleaned and back into the interceptor sewer. All existing wastewater flows, plus waters added to the flow due to cleaning, shall be contained within the existing sewer system. The bypass system shall have the necessary capacity to handle all the flow.

The Contractor shall be responsible for furnishing the labor and supervision necessary to set up and operate the pumping and bypass system. For pumping and bypassing operations, a plan must be submitted in accordance with the procedures set forth in the submittals section.

In performing the work under this Contract, Contractor shall be thoroughly familiar with federal, state, and local statutes, ordinances, and directives with respect to excessive noise and pollution of air and water due to construction operations. If pumping and bypassing is required, engines shall be equipped in a manner to keep noise to a minimum.

3.07 ACCEPTANCE OF WORK.

Contractor shall televise the sewers, in accordance with the television inspection section, upon the completion of cleaning. Acceptance of sewer line cleaning shall be based upon the review of the inspection videos by the Owner or Owner's Representative.

If cleaning inspections show the cleaning to be unsatisfactory, the Contractor shall be required to reclean and reinspect the sewer line, at no additional cost to the Owner, until cleaning is shown to be satisfactory.

End of Section.