Request for Bid
Group 5 CIPP Addendum No. 3 to
RFB No. 422290.71.0427
May 8, 2025

The following information encompasses Addendum No. 3 for the above referenced RFB. Bidders shall fully consider and acknowledge this Addendum in the preparation and submittal of its formal Bid. Failure to do so may result in the rejection of the Bid.

Section 1 – Additional Bidder Questions Received to Date

Section 2 – Updated 00170.16 Selection Schedule

Section 3 – Updated 00370.3.1 Unit Price Bid Form

Section 4 – Updated Specification 02541, Addition of List of Streets

All other conditions and requirements remain unchanged.

Section 1
Additional Bidder Questions

Q1: Heavy Cleaning is set forth in the bid schedule below as “Crew Hours”, but in the specifications sections below as per LF. Therefore, will the Owner please consider changing the specifications to read “Crew Hours” as well? Also, will the Owner please define “Crew Hours”. We assume the intent is heavy cleaning by the hour, regardless of each bidder’s crew size.

SARP10: The intent is for heavy sewer pipe cleaning to be billed based on the number of hours cleaned, irrespective of the crew size performing the work. Please refer to the revised Specification Section 02541 included in this addendum.

Q2: Do you have any videos and/or CCTV logs available for review?

SARP10: SARP10 has deemed these pipes good candidates for CIPP and will give access to videos after the bid.

Q3: Where can the contractor dispose of debris collected during the cleaning/CCTV phase and what are the associated fees, if any?

SARP10: The City has a profile for North and South Shelby Landfill with no fees associated with the contractor.

Q4: Do you have any flow data available for the 18”-27” diameter segments? If not, please provide a flow rate that is required to be bypassed.

SARP10: SARP10 does not have any flow data. See Specifications section 02535 Execution 3.05 Bypass Pumping.

Q5: Could you please provide access to the GIS?

SARP10: SARP10 does not grant access to the GIS to subcontractors for bidding purposes.

Q6: Currently, the CIPP spec states “the preferred method of curing CIPP shall be by circulated water. The use of controlled steam will be considered on a case-by-case basis only. The Subcontractor shall submit a written request for the use of steam in sewer segments where the Subcontractor feels that curing by steam will be beneficial to the finished product. The Subcontractor shall not assume in any case that the use of controlled steam for the curing of CIPP is acceptable to the Purchaser without prior written authorization from the Purchaser.” Would you please consider allowing air inversion and steam curing on 8”-12” diameters?

SARP10: This project specifically utilizes water cured only and will utilize steam on a case-by-case basis.

Q7: Currently, the CIPP spec requires a 4 psi air test for minimum 5 minute duration after a 2 minute stabilization period on all 18" diameter and smaller sewers. If water inversion and curing is required, would you consider allowing leakage testing to be observed while under positive pressure during water inversion and curing in lieu of a separate air test? If not, what is the allowable pressure drop over the minimum 5 minute test period?

SARP10: For bidding purposes, air testing will be required as the leak test method. The allowable pressure drop is 1psig, refer to table on page 02530-25.

Q8: Is there any manhole rehabilitation (lining,/coating, bench/channel repairs, etc.) on this project? There are a few shown on the drawings and also manhole rehabilitation specifications but currently no bid items for this work.

SARP10: The manhole rehabilitation will be removed from the scope of work.

Q9: For the Post Rehab MACP Level 2 Manhole Inspections, could you please provide a table or scope for which manholes are to be inspected, or are we to assume all manholes associated with mainline CIPP lining will be part of this scope?

SARP10: All manholes associated with mainline CIPP shall have Post Rehab MACP Level 2 Manhole Inspections.

Q10: The specs state for major streets (defined as Shelby County Principal Arterial & Minor Arterial) require a City approved permit as well as a Traffic Control Plan submittal to the City and signed by a TN PE, and also requires a two week lead time for permit processing.

- What is the permit cost? Is a permit required for each setup, or will a blanket permit be allowed, especially for similar work or work areas?

SARP10: There is no cost to the contractor.

- Please define or delineate the Shelby County Principal Arterial & Minor Arterial roadways.

SARP10: There are restrictions on certain streets where lanes can only be blocked from 9:00 am till 3:00 pm in the day and 10:00 pm – 5:00 am. The list of these sections is included in this addendum.

- Will the use of uniformed officers be required, or at the discretion of the contractor?

SARP10: Use of uniformed officers is at the discretion and expense of the contractor.

Q11: Currently, this project allows for 335 calendar days for substantial completion. Due to the amount of open-cut repairs that will be needed ahead of CIPP lining as well as water curing only for nearly 50k LF of CIPP, and the post-rehab inspections, would you please consider revising the substantial completion to 540 calendar days?
SARP10: Based on past production, we believe this contract duration is adequate.

Q12: When is the anticipated award and Notice to Proceed?
SARP10: This project is SRF funded therefore the anticipated NTP is unknown due to approval process. In the past, this process has taken between 3 – 6 weeks.

Q13: Do you have an engineer's estimate and/or budget for this project?
SARP10: We have an estimate for this project but will not be disclosing this number.

Q14: On Plan Sheet J5 /F7 there is indication of a railroad right-of-way which appears to belong Canadian National Railroad. Will the Owner please confirm if railroad permits have been obtained and/or will be required? If required, the permits will need to be obtained by the Owner and should outline any railroad flagging and any other requirements. Therefore, will any associated permits and costs be handled/paid by the Owner, or will the Owner please add an allowance bid item for these costs, as they are unknown until the permit is obtained?
SARP10: Bidder is not required to obtain any permits associated with this work. Any permits will be obtained by SARP10.

Section 2
Updated 00170.16 Selection Schedule

carry out the obligations and to complete the Work contemplated therein. All Responses will be rejected if there is reason to believe that collusion exists among Respondents. Responses will be considered irregular and may be rejected if they show serious omissions, alterations in form, additions not called for, conditions or unauthorized alterations, or irregularities of any kind.

00170.14 Other Items

This Bid does not commit Purchaser to enter into a Subcontract, nor does it obligate Purchaser to pay for any costs incurred in the preparation and submission of Responses or in anticipation of a Subcontract. Costs of preparing the Bid in response to this request are solely the responsibility of the Respondent.

By responding to this solicitation, the respondent attests that no employee of Black & Veatch, Overland Contracting, Allen & Hoshall, Allworld Project Management, Gresham Smith, Carter-Malone Group, or City of Memphis employee or any such person's spouse, child, parent, brother, sister, dependent or person assuming a relationship being the substantially equivalent of the above, has an existing or pending, direct or indirect, financial interest in the respondent's business.

No Respondents to this solicitation shall discriminate against any employee or applicant for employment because of race, religion, color, sex, age, or national origin.

00170.15 Selection Process

Purchaser intends to select one Firm based on price and successful completion and approval of the OCI Registration process.

00170.16 Selection Schedule

The following schedule will be adhered to during the selection process. It is subject to change at the sole discretion of OCI.

Event	Completed By
Advertising Date	April 8, 2025
Pre-Bid Meeting	April 17, 2025
Registration Information submitted per 422290.71.0427 Advertisement	May 1, 2025
Last Date for Bidder Questions	May 1, 2025
Issue Addendum for answers to questions	May ~~6~~ 8, 2025
Receive all Bids	May ~~13~~ 15, 2025 by 2:00 pm local time
Public Opening	May ~~13~~ 15, 2025 immediately following receipt of bids
Public Notice of Intent to Award	May 27, 2025
Preconstruction Meeting with Subcontractor	June 3, 2025
Tentative Notice to Proceed	June 3, 2025

00170.17 Mandatory Pre-Bid Meeting

A mandatory pre-bid meeting will be held at **9:30 A.M** (local time) at the **Environmental Maintenance Office, 2865 Frayser Boulevard, Memphis, TN 38127** on **April 17, 2025**. Bidders are required to attend at their own cost.

Section 3
Updated 00370.3.1 Unit Price Bid Form

Table 00370.3.1 - Unit Price Bid Form

Bidder should refer to Section 00270, Instructions to Bidders, when completing this Bid Form. Bidder shall complete this form entirely and return it with Bidder's Bid.

Bid Submitted by: (Company Name)

00370.3 Bid Pricing Information

00370.3.1 Unit Pricing

Bidder proposes to complete the RFB Work based on firm, fixed, unit prices (US dollars), which prices multiplied by the final Work quantities would represent the full consideration to Bidder for its complete and satisfactory performance of the Work in compliance with all the terms and conditions of the RFB Documents. The Unit Prices in this Table include the cost of all the work which is required or implied by the RFB documents or which may be inferred therefrom, and which is customarily provided in furnishing a complete and finished work item of its kind. Further, any and all alterations, modifications, and adjustments to the work item, which is reasonably foreseeable or customarily encountered in providing and installing equipment, material, and services of the work item kind, will be performed without additional compensation.

In the event of a Purchaser-approved change in the scope of Work for which a unit price from this Table is not applicable, as determined by the Purchaser, the Subcontractor shall provide a new unit price for review and acceptance by the Purchaser. Subcontractor shall provide all information requested by the Purchaser to substantiate the value of the new unit price.

00370.3.1.1 Unit Prices Breakdown

Item Number	Item Description	Unit of Measure	Estimated Quantity	Bidder Response Columns: Unit Price	Bidder Response Columns: Extension Price
71.0427 Group 5 CIPP					
CIPP					
02535-4.02.A	8” Diameter CIPP (0-10 feet)	Linear Foot	24,476		$ -
02535-4.02.A	8” Diameter CIPP (10.1-20 feet)	Linear Foot	11,321		$ -
02535-4.02.A	10” Diameter CIPP (0-10 feet)	Linear Foot	2,629		$ -
02535-4.02.A	10” Diameter CIPP (10.1-20 feet)	Linear Foot	2,298		$ -
02535-4.02.A	18" Diameter CIPP (10.1-20 feet)	Linear Foot	1,742		$ -
02535-4.02.A	24" Diameter CIPP (10.1-20 feet)	Linear Foot	150		$ -
02535-4.02.A	27" Diameter CIPP (0-10 feet)	Linear Foot	2,658		$ -
02535-4.02.A	27" Diameter CIPP (10.1-20 feet)	Linear Foot	2,002		$ -
02535-4.02.B	Bypass Pumping (18" Diameter)	Each	6		$ -
02535-4.02.B	Bypass Pumping (24" Diameter)	Each	1		$ -
02535-4.02.B	Bypass Pumping (27" Diameter)	Each	14		$ -
02535-4.02.C	Lateral Reinstatement	Each	756		$ -
02535-4.02.E	Locate and Expose Mainline Terminus	Each	1		$ -
02535-4.01.E	Traffic Control for CIPP	Crew Day	252		$ -
Mainline Point Repair					
02540-4.01.A-1.a	Sewer Point Repair, 6” Through 10” Pipe (<10’ Deep)	Each	43		$ -
02540-4.01.A-2.b	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 6” Through 10” Pipe (<10 Deep)	Linear Foot	10		$ -
02540-4.01.A-2.a	Sewer Point Repair, 6” Through 10” Pipe (10.1’-15’ Deep)	Each	25		$ -
02540-4.01.A-2.b	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 6” Through 10” Pipe (10.1’-15’ Deep)	Linear Foot	10		$ -
02540-4.02.A.8.a	Sewer Point Repair, 21" Through 27" Pipe (<10' Deep)	Each	1		$ -
02540-4.01.A-8.b	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 21” Through 27” Pipe (<10" Deep)	Linear Foot	10		$ -
02540-4.02.A.9.a	Sewer Point Repair, 21" Through 27" Pipe (10.1'-15' Deep)	Each	2		$ -
02540-4.01.A-9.b	Each Additional Linear Foot Beyond the 10 Feet Minimum, For Sewer Point Repair, 21” Through 27” Pipe (10.1’-15’ Deep)	Linear Foot	10		$ -
02540-4.01.B	Each Service Connection and Associated Lateral Pipe Included In a Sewer Point Repair, All Depths, All Diameters	Each	24		$ -
02540-4.01.C	Traffic Control per Point Repair	Each	71		$ -
02540-4.01.D	Pavement Backfill for Point Repair	Cubic Yards	2,500		$ -
02540-4.01.E	Hydroexcavation/Hand Digging	Each	71		$ -

Item Number	Item Description	Unit of Measure	Estimated Quantity	Unit Price	Extension Price
Post-Rehabilitation PACP Inspection					
02541-4.01.B	Post Rehab CCTV Inspection (≤ 21" diameter)	Linear Foot	38,546		$ -
02541-4.01.B	Post Rehab CCTV Inspection (≥ 24" diameter)	Linear Foot	4,430		$ -
02541-4.01.C	Heavy Cleaning All Diameters	Crew Hours	250		$ -
02541-4.01.D	Remote Trimming of Protruding Service Lateral	Each	30		$ -
Post-Rehabilitation MACP Inspection					
02544-4.01.A	GPS Coordinates of Manhole Cover	Each	154		$ -
02544-4.01.C-1	Post Rehab MACP Level 2 Manhole Inspections	Each	152		$ -
02544-4.01.C-2	Post Rehab MACP Level 2 Manhole Inspections with 3D Scan	Each	2		$ -
Site Preparation and Restoration					
02230-01	Clearing and Grubbing	Acre	2		$ -
02921-5.01	Sodding	Square Yard	250		$ -
Pavement and Incidentals					
02950-4.01.A-1	Asphaltic Concrete Pavement Removal and Replacement	Square Yard	650		$ -
02950-4.01.A-2	Concrete Pavement Removal and Replacement	Square Yard	5		$ -
02950-4.01.B	Concrete Sidewalk Removal and Replacement	Square Yard	47		$ -
02950-4.01.C	Concrete Curb and Gutter Removal and Replacement	Linear Foot	100		$ -
02950-4.01.E	Temporary Cold Patch	Square Yard	100		$ -
71.0427 Group 5 CIPP - Total Estimated Unit Price Value					$ -

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Section 4
Updated Specification 02541, Addition of List of Streets

SECTION 02541
CLOSED CIRCUIT TELEVISION INSPECTION OF SEWER MAINS & CONNECTIONS

PART 1 General

1.01 SCOPE

A. This Work will consist of cleaning and Pipeline Assessment Certification Program (PACP) internal closed circuit television (CCTV) surveys to digitally inspect and record conditions of existing sanitary sewer mains and connections. Sewer pipes and connections to be inspected are located in both improved streets, arterial and primary roads, backyards and unimproved easements.

B. The Work covered by this section includes furnishing all labor, competent PACP certified technicians, equipment, tools, accessories, and materials required to clean and inspect the designated sanitary sewer lines.

1.02 SUBMITTALS

A. PACP Requirements

1. PACP compliant inspections, logs, data, and photos shall be delivered to the Program Manager (from hereon Program Manager shall be interpreted as “Program Manager or his designee”) on external hard drive(s) which will become property of the Program Manager. Data files shall be formatted to facilitate upload into a PACP compliant Exchange database or internet uploads formats to an FTP site approved by the Program Manager.

B. Unless otherwise specified all sample submittals shall be delivered to the Program Manager within two weeks of the NTP.

C. For rehabilitation work, only Post-Rehabilitation PACP submittals will be required by the Purchaser. All CCTV done prior to rehabilitation shall be at the expense of the Subcontractor to ensure conformance with the Specifications.

D. Traffic Control

1. Traffic Control Plan shall be submitted to the Program Manager, including the following items:

a. Outline of permit acquisition procedure for lane closures.

b. Methods for proper signing and barricades, which comply with City of Memphis requirements.

c. Major streets (e.g. Shelby County Principal Arterial & Minor Arterial) requiring a City approved permit if taking a lane for mobile operations, secured through Traffic Control Plan submittal to the City and signed by a TN P.E. The City requires two- week lead time for permit processing.

i. The Subcontractor will be required to deliver a sample primary/arterial road Traffic Control Plan for review by the City.

ii. If the City determines that the nature of the work operation or the type of road in which the Subcontractor is working requires a permit, the Subcontractor will be

required to modify the sample Traffic Control Plan to obtain a permit from the City.

d. For everywhere else where a permit is not required, the Subcontractor shall develop, provide, and implement a traffic control plan for all mobile operations in accordance with standard MUTCD specifications.

E. Permits

1. The Subcontractor is also responsible for acquiring all necessary disposal and/or landfill site permits as required to perform this work.

2. Railroad Rights of Way: The Subcontractor shall notify the Program Manager when work or access to manholes and sanitary sewers lie within the 25 feet railroad easement as measured by 25 feet outside the nearest rail of the tracks. To access sewer facilities within the 25 feet of the railroad right of way the Subcontractor shall contact the Program Manager 48 hours in advance who will alert the City's Zone Construction Inspector to coordinate individual railroad direction and guidance.

3. Permit required confined space entry plans in compliance with the Loss Control Manual.

F. Copies of National Association of Sewer Service Companies (NASSCO) certification for all field staff conducting PACP inspections.

G. Sample of PACP compliant television survey log in MS Access format.

H. Sample of PACP compliant video inspection in MP-4 (Web optimized) format.

I. Cleaning and CCTV vehicle, equipment, and cleaning supplies list.

J. Disposal site(s) and appropriate landfill permits for appropriate disposal of all waste materials removed from the sewer during the light and heavy cleaning operations.

1.03 DELIVERABLES

A. Records

1. Pipe Cleaning Record

a. The Subcontractor shall provide a dated manifest of the volume or weight of the dewatered sewer cleaning loads taken and dumped at the permitted landfill. Each waste load manifest shall be associated with a list of corresponding sewer segments from where the waste originated.

2. Digital Inspection Record

a. In the digital PACP V.6.0.1 compliant format, the Subcontractor shall provide the following information:

i. Digital CCTV survey inspection which shall be recorded and shall be continuous as the inspection proceeds through the manholes and sewer pipes. Inspection videos should be delivered in an MP-4 (Web optimized) format.

ii. Digital Recordings: The digital recording shall document the visual and audio record of the manhole and sewer pipe inspection and shall be the basis of measurement and payment. Digital recording playback shall be at the same

speed that it was recorded. Original digital recordings for the Project shall be forwarded to the Program Manager on clearly labeled external hard drive(s) in PACP ACCESS format with final report submittals and shall become the property of the Program Manager. Data for a single facility asset will not be split across multiple hard drives. Digital recordings shall be available to the Program Manager by the close of business on the Monday following a week after data acquisition. File naming must be consistent. Additional instructions, naming conventions, file structures, etc. will be provided after contract award.

(1) Picture Quality: The sewer inspection digital record shall be free of steam, fog, vapor, or other headspace distortion that degrades the quality of the picture from the intended purpose of evaluating the sewer for structural and watertight integrity. If necessary, the Subcontractor shall provide positive ventilation or other means through the sewer pipe to draw out steam, fog, and vapor that will degrade the recorded image of the pipe.

3. Inspection Documentation Logs

a. Observations made during television inspection shall be documented in an unmodified PACP compliant manner within an electronic inspection log form, supported by accompanying audio, digital photographs and MP-4 (Web optimized) format recording written to an external hard drive and submitted to the Program Manager. Hard copies of completed inspection log photographs shall be furnished to the Program Manager with invoicing.

4. Electronic & Hard Copy Records

a. Reports:

i. The Subcontractor shall prepare printed inspection log reports for each associated sewer pipes inspected during the actual field inspection activities. These field logs shall then be reviewed by the Subcontractor's technical staff, along with reviewing the associated digital video record, as a means of ensuring that no defects or entries are omitted or incorrect. Edited field logs shall then be used in the final project reports and submitted in pdf format.

b. Draft Report and Final Report:

i. The Draft Final Report will contain electronic and hard copies of each of the PACP CCTV log pipe segment inspection logs. Digital recordings of the inspections written to an external hard drive and the PACP compliant database of the inspections in ACCESS format shall also be submitted in electronic and pdf format.

ii. Draft Report shall be delivered to the Program Manager within fifteen working days the last or final inspection. The Program Manager will have two work weeks to review and comment. Subcontractor shall address all comments provided and submit a Final Report within one work week upon receipt of comments. At the Program Manager’s discretion a meeting will be held so the Subcontractor can explain the processes used to address the comments.

5. Quality

a. Rejection of deliverables will be submitted to the Subcontractor via the Program Team in a written communication discussing issues that must be addressed. The Subcontractor will be required to follow up with a response within three business days upon receipt of the written communication. Subcontractors will have seven (7)

calendar days from the rejection notice date to make the necessary corrections and resubmit the data deliverable in its entirety.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. General

1. All equipment used for PACP compliant CCTV sewer segment inspections of existing sanitary sewer mains and connections shall be specifically designed and manufactured for the purpose intended under this Contract. The software and hardware for the electronic capture of the inspection defects and recorded observations must be Version 6.0.1NASSCO PACP compliant.

2. The Subcontractor shall submit an equipment list to the Program Manager for approval before the commencement of the Work and shall certify that back-up equipment is available and can be delivered to the worksite within 72 hours.

3. The Subcontractor shall provide equipment to perform inspections of sewer mains located in streets, street rights-of-way, backyards, easements and rights-of way that are off-road.

    a. Including but not limited to portable CCTV equipment, vehicles capable of transporting TV equipment and accessing remote easements, and adequate cleaning equipment rights of way or easement applications.

B. PACP Compliant Software & Data Logger Requirements

1. Data logger

    a. Internal inspection logs created and captured electronically during the television inspection through the use of commercially available electronic data loggers in the truck are required. NASSCO PACP protocols Version 6.0.1 shall be used for capturing and recording the observations. Audio commentary made during the inspection and captured on the digital video shall correspond with the PACP observations on the log.

    b. The data logger equipment and software shall allow the Program Manager access directly to the captured electronic data and provide for a non-proprietary export of the data into MS ACCESS databases in accordance with PACP standards for standalone database review.

2. Software must be compliant with the NASSCO PACP V.6.0.1 standards. Follow PACP protocol for recording of observations and defects for sewer mains.

    a. All software shall be capable of providing complete survey reports in compliance with PACP, and the software shall be the V.6.0.1 of the PACP compliant software.

    b. The Program Manager has no intent to specify which software the Subcontractor shall use, but requires the software and the submitted database to be fully compliant with PACP V.6.0.1 and capable of being exported to ACCESS databases. No payment will be rendered for improperly formatted data.

    c. Software and data logger must be capable of capturing sewer main and sewer lateral observations by PACP descriptions, record travel footage along pipeline, and video

time stamp the recorded observations to support hyper linking from the digital record to the event point or location within the digital inspection record. The same requirements apply to still photo images (if provided) which shall follow PACP guidelines and be hyperlinked to the inspection log.

C. Sewer Main CCTV

1. Sewer Main Digital Color Video Camera

a. All cameras used shall be digital format color CCTV units specifically designed and constructed for use in sewer pipe inspection work. The cameras shall be operable in 100 percent humidity conditions. The camera shall have a high-resolution, 360- degree pan and tilt or rotating head with a wide viewing angle lens and either automatic or remote focus and iris controls. Camera lighting shall be sufficient for use with digital color inspection cameras and for the manhole and pipe diameters identified in the contract.

i. Camera, Television Monitor, and Other Components shall be capable of producing a high resolution color digital inspection record.

ii. Video file to be in MP-4 (Web optimized) format

b. In all cases, the complete digital inspection system (camera, lens, lighting, cables, monitors, and recorders) shall be capable of providing a digital picture and digital video quality acceptable to the Program Manager. Inadequate lighting, image distortions, blurry or murky images, and dirty lenses will be a cause for rejection. No payment will be made for unsatisfactory inspections and the Subcontractor shall perform work until deliverable is of acceptable quality. Digital video cameras/digital recorders not specifically intended for use for internal television inspection of manholes and sewer lines shall not be permitted.

c. Pan and tilt type camera, capable of turning at right angles to pipe’s axis over an entire pipe wall perimeter shall be used.

i. The camera lens shall be capable of self-righting itself after a lateral view or connection view with a return view down the pipe with a “home" capability for the lens.

d. Lighting shall be suitable to allow clear picture of entire inner pipe wall extending at least 10 feet in front, including black High Density Polyethylene (HDPE) pipe.

e. Document header and observations shall be in accordance with PACP V.6.0.1protocols.

D. Cleaning Equipment

1. Hydraulic sewer pipe cleaners or combination hydraulic/vacuum cleaners shall be specifically designed and constructed for such cleaning.

2. Mechanical sewer pipe cleaners shall be specifically designed and constructed for such cleaning.

3. The Subcontractor shall possess equipment capable of hydraulically or mechanically cleaning a minimum of 1,000 linear feet of pipe from one direction and have a minimum 1,000 linear feet of hose or cable on-site during the cleaning execution.

4. Hydraulic sewer pipe cleaners shall be specifically designed and constructed for such cleaning. The sewer cleaner shall have a minimum usable water capacity of 600 gallons and a pump capable of delivering at least 30 gallons per minute at 1,500 psi at the nozzle.

    a. The hydraulic cleaning equipment shall have multiple hydraulic cleaner hose nozzles for a variety of sewer cleaning conditions, including grease, roots, debris and granular materials.

    b. Vacuum equipment shall be capable of lifting debris removed from the segment from the downstream manhole.

5. Mechanical sewer pipe cleaners (cable machines with buckets, brushes, swabs, root cutters, and power rodders with similar capability) shall be capable of controlled forward and reverse travel through the sewers without inflicting damage to the existing pipe in removing rocks, grit and other heavy debris and roots.

PART 3 EXECUTION

3.01 INSPECTIONS

A. CCTV Inspection of Sewer Mains

1. Cleaning

    a. Sewer pipe cleaners or combination hydraulic-vacuum cleaners must accompany CCTV units at all times. Ideally, sewers lines are to be cleaned and then followed immediately by CCTV inspection. All sewers must be cleaned in advance of CCTV during the same calendar day they are inspected.

    b. Light Cleaning

        i. Before CCTV work, the Subcontractor shall light clean the sewer line from manhole to manhole, from upstream to downstream direction unless an obstruction is encountered, one sewer section at a time and performed as efficiently as possible at the Subcontractor’s discretion.

        ii. Materials shall not be passed from one sewer segment to another but must be trapped and removed from each sewer segment prior to CCTV inspection.

    c. Heavy Cleaning

        i. If a camera is inserted and additional debris or impediments to inspection are observed following the required light cleaning, heavy cleaning shall be approved by the Program Manager. Sections of pipe containing significant roots, large areas of debris, and/or several inches of depth of sands and gravels that will require the use of additional hydraulic nozzles, cable/bucket machine, power rodders and root cutters is considered heavy cleaning.

        ii. Heavy cleaning will be proposed by the Subcontractor and approved by the Program Manager. The Subcontractor must obtain prior approval for heavy cleaning in each sewer segment in order to receive payment for heavy cleaning.

d. Cleaning Execution

i. No roots, grease or debris from light or heavy cleaning shall be passed from sewer segment to sewer segment during the cleaning operation. All debris flushed from the sewer must be collected, captured, and removed from the sewer at the downstream manhole.

ii. Roots shall be removed in the sections where root intrusion is a problem. Special precautions shall be exercised during the cleaning operation to assure complete removal of visible roots from the joint area and so as not to incur further damage to the pipe. Any visible roots that may impact rehabilitation efforts shall be removed. Fine roots are allowed if the Subcontractor made a heavy cleaning attempt to remove roots with proper root removal means. Procedures may include the use of mechanical devices such as rodding machines, expanding root cutters and porcupines, and hydraulic procedures such as high-pressure jet cleaners.

iii. The Subcontractor is responsible for safe, responsible and legal handling and disposal of all material and debris removed from the sewers. The Subcontractor is responsible for all permits and landfill fees associated with the disposal of debris collected and removed from the sewer.

i. Proper disposal arrangements are the exclusive responsibility of the Subcontractor. The Subcontractor shall provide a dated manifest of the volume and weight of the dewatered sewer cleaning loads taken and dumped at the permitted landfill. The Subcontractor shall not dispose of debris at a City of Memphis Wastewater Treatment Plant. Each waste load manifest shall be associated with a list of corresponding sewer segments from where the waste originated.

2. Sewer Flow Levels During Inspection Operations

a. Maintain low sewer flow during inspection by using sandbags or flow-through plugs or by inspecting during low flow times of day, evening, or early morning hours while camera is moving and recording observations in the sewer segment. Any items used to restrict flow shall be removed immediately after intended use.

i. Flow-through Plugs: If used, secure the plugs so as to remain in place during inspection. Use a fail-safe device at the downstream pipe connection to ensure the plug is not lost in the downstream sewer segment if it becomes dislodged from the upstream pipe connection.

ii. Conduct all cleaning and CCTV operations to prevent building backups and sewer overflows.

iii. Subcontractor shall be responsible for cleanup, repair, fines, property damage costs, and claims for any sewage backup, spillage or sanitary sewer overflow during or as a result of the cleaning and inspection operations.

b. Allowable Depth of Flow For Inspection Operations

i. For effective inspection, all flow shall be minimized in the segment being inspected. However, the depth of flow at the upstream manhole of the interceptor section being worked shall be within the specified limits provided herein.

c. Maximum Allowable Depth of Flow for CCTV Inspection

i. 6 - 10 inch diameter Pipe - 20% of pipe diameter

ii. 12 - 18 inch diameter Pipe - 25% of pipe diameter

iii. 24-inch diameter and Larger Pipe - 30% of pipe diameter

iv. Exceptions to these guidelines shall result in rejection, and non-payment, of the CCTV inspection unless approved in advance by the Program Manager.

3. Camera Operations

a. Using the pan/tilt feature, pan the interior of the manhole for record purposes in accordance with V.6.0.1 PACP protocols and begin and terminate the inspection in the starting and ending manholes.

i. Capture the inside of manhole walls, manhole channel, and pipe connection to wall at both upstream and downstream manhole and lateral connections using the digital mainline sewer camera and the pan/tilt feature.

b. Place the camera at center of manhole and commence video before entering pipe.

i. Start footage counter at manhole wall/pipe connection or at a short pre-measured distance down the pipe for the sewer segment inspection.

c. Connections: The digital camera shall be used to look at connections and up laterals from the connection in the main sewer pipe being inspected. The camera shall pause, pan, and record all connections. Conditions noted in these sidelines and laterals shall be noted on the inspection logs.

d. Mainline camera operations:

i. Move through line at speed no greater than 30 feet per minute stopping for minimum 10 seconds to record lateral connections, mainline connections, defects, and features and points of interest.

ii. Do not float camera.

iii. Maintain technical quality, sharp focus, and distortion free picture with the camera lens centered in the pipe for the different diameters inspected.

(1) Eliminate steam in line for duration of inspection.

(2) Utilize blower as needed to defog sewer line.

iv. Digitally record a complete sewer segment in its entirety with no breaks, “blink-outs,” or interruptions from manhole to manhole according to PACP V.6.0.1 formats.

v. Pan, tilt, and rotate as necessary to best view and evaluate lateral connections, pipe defects, features, obstructions, and points of interest.

vi. Use power winches, powered rewinds, self-propelled tractors, or other devices that do not obstruct camera view or interfere with proper documentation of sewer conditions to move camera through sewer.

(1) Whenever non-remote powered and controlled winches are used, set up telephones or other suitable means of communication between manholes to insure good communication.

vii. Use hydraulic jet nozzle pressure and flow to remove standing water from depressions or sags in the sewer, if necessary, for complete inspection of the sag portion of the sewer segment.

viii. Measurement for location of defects and service laterals:

(1) At ground level by means of Program Manager-approved footage counter or metering device.

(2) Electronic display measurement meters: Accurate to PACP standards over length of section being televised.

(3) Do not pull unnecessary length of slack camera cable if it impacts the footage counter.

ix. Stop camera at service connections and inspect lateral with pan and tilt camera.

(1) Identify building connection in PACP compliant terms as active, capped, or abandoned.

(2) If no wastewater flows are being discharged from building, consider steady, clear observed flow as infiltration/inflow.

x. Identification of Defects

(1) If roots, sludge, or sediment material impedes inspection after the light cleaning, withdraw camera and perform heavy cleaning at the direction of the Program Manager.

(2) Upon completion of heavy cleaning operation, resume internal inspection.

(3) Furnish media confirmation for heavy cleaning (more than three passes with jet cleaner) to Program Manager.

(4) If protruding tap impedes inspection trim protruding tap to 1/2 inch.

xi. If obstructions are not passable and cannot be removed by sewer cleaning, withdraw CCTV equipment and perform a reverse inspection from opposite end of the sewer segment in accordance with PACP protocols.

(1) Subcontractor shall be responsible for costs associated for reverse set-ups when an obstruction is encountered that cannot be passed.

(2) Subcontractor shall be responsible for all judgments and impacts as to whether an obstruction in the sewer main can be passed. Costs involved in extracting a stuck camera in the sewer main will be borne by the Subcontractor and at no additional cost to the Program Manager.

(3) When additional obstructions are encountered after reversal of equipment and no means are available for passing a second obstruction in order to complete the sewer main inspection, remand the segment inspection to the

Program Manager for resolution. The portion of the main inspected will be paid for as prescribed.

xii. Undocumented facilities

(1) If undocumented manholes or sewer mains (facilities not on the field updated GIS sewer maps) are encountered during the inspection, the Subcontractor needs to complete the documentation requirements per PACP requirements and capture on the video the following:

(a) Approximate horizontal distance from the upstream or reference manhole.

(b) Approximate depth of the undocumented manhole by turning the pan/tilt camera vertically and estimating the height of the cover from the invert.

(c) A provisional manhole asset ID number shall be used by the Subcontractor by adding a dash and two-character number to the closest upstream manhole ID.

xiii. Retrieval of Stuck Equipment

(1) The Subcontractor is responsible for hiring a licensed sub-Subcontractor to retrieve any equipment/foreign objects that get stuck in the sewer system through the execution of the scope of work (fallen cameras, jet nozzles, inflatable plugs, sandbags etc.) at the Subcontractor's own cost. Such retrieval by an appropriately licensed sub-Subcontractor shall be made within 72 hours to avoid interfering with the City of Memphis sewer system operations. Any and all impacts and related costs due to the Subcontractor's equipment in the line shall be the responsibility of the Subcontractor. Subcontractor shall follow SARP10 sewer point repair specifications outlined in "Section 02540 Sanitary Sewer Point Repairs" and "Section 02950 Removal and Replacement of Pavements and Incidentals" during retrieval of equipment. Also per "00585.2.2 Safety, Health, and Accident Prevention Program," Purchaser must approve sub-tier Subcontractors prior to mobilization to the jobsite.

4. Quality Assurance

a. With each monthly invoice the Subcontractor shall provide a QA/QC memo documenting that 10% of the previous month's CCTV data has undergone a random, independent review by a PACP certified reviewer using NASSCO standards for Television Inspection of Main Sewer and PACP Quality control as the basis for the QA/QC procedures. The independent reviewer shall be a Tennessee P.E. or is a P.E. in another state and has a Tennessee P.E. license pending. Each line segment which has been randomly reviewed shall be identified in the QA/QC memo as well as any subsequent findings or recommendations. Internal independent QA/QC is acceptable, as long as the person is a Tennessee P.E. or is a P.E. in another state and has a Tennessee P.E. license pending. Failure to submit the QA/QC memo shall delay payment of the current month's invoice.

b. For all new Subcontractors and Operators who begin PACP coding, an initial review of CCTV data will consist of reviewing, at a minimum, 20 of the first 100 PACP inspection records submitted. Subsequent reviews will be based on the results of the initial reviews as explained below.

c. Auditing Procedures:

i. Header Information: As explained in the NASSCO PACP Quality Control Standards each audited inspection record is given an accuracy level for the header information and the detailed observation records. It is expected that the accuracy of the header record exceed 90% because the majority of the contents are based upon facts and not subject to operator judgment. To assess the accuracy level of the header, record the number of errors as compared to the total number of header fields using the following formula:

(1) **100% - (error count/total header fields)*100% = Header Accuracy**

ii. Detailed Observations: Determining the accuracy level for the detailed observation records is similar to the method for assessing the header record. The main difference being that a defect observation has multiple data entries that must also be counted towards the total number of entry fields. In the event that a defect is not coded all of the required entries for coding the missed defect are counted towards the total error count. The following formula is used to calculate the accuracy level of the detailed observation records:

(1) **100% - (error count/total entries) * 100% = Detail Accuracy**

iii. Review Scoring and Results

(1) Satisfactory Review, No changes required. Accuracy Level of 90% or above for both the Header Record and Observation Detail with no major errors or omissions found.

(2) Unsatisfactory Review (below levels of acceptance) will not be accepted by the Program Manager and will not be considered payable items in the Subcontractor's Request for Payment.

5. Deliverable Documentation

a. Mainline Sewer

i. Submit V.6.0.1 PACP compliant records, logs, and electronic inspection data for sewer line inspection to Program Manager by the close of business on the Monday following a week after data acquisition.

ii. Monthly QA/QC memo submittal listing which segments have been randomly reviewed, as well as any subsequent findings or recommendations.

iii. Digital videos, data, and photos shall be delivered to the Program Manager on external hard drives which will become property of the Program Manager.

iv. Data files shall be formatted to facilitate upload into a PACP Exchange Database with the approval of the Program Manager.

v. Inspections displaying poor digital video/audio quality will be rejected. Quality refers to, but is not limited to, grease or debris on lens, camera under water, image too dark or light, image washed-out, distorted image, out of focus images, lines improperly cleaned, and poor/no audio.

vi. Subcontractor will re-televise rejected inspections and resubmit inspections at no additional cost to the Program Manager.

b. Map changes/undocumented manholes:

i. For map changes identifying undocumented manholes and network changes which were found as a result of field inspections or observations, a Map Edit Form shall also be prepared and supplied by the Subcontractor with a drawing or sketch and shall indicate special details, field measurement or distances, or locations about an observed undocumented manhole or a change to the sewer network. The Map Edit Form should also identify buried manholes and siphons that have been encountered.

ii. Subcontractor shall indicate all buried manholes identified in the field via CCTV using the provided Buried Manhole Form. Any additional manholes that have not been located or verified via CCTV but are impeding the completion of required CCTV work should be designated as unable to locate (UTL) and be included on the form.

c. Incident observation and data collection:

i. The Subcontractor shall report all buried manholes, pipe collapses, large void, utility conflicts, Unable to Complete line segments, and heavy cleaning requests to the Program Manager through the program-defined reporting application (Teamworx) and shall fill out all required fields and attach picture documentation as necessary. At least one picture shall be included showing the incident or condition of the sewer line encountered that required it to be recorded. All reported incident observations will be monitored by the Program Manager and inadequate reporting will result in a meeting between the Program Manager and Subcontractor.

6. Easement or Turf Operation

a. The Subcontractor will restore the work area to its original condition as quickly as possible after the inspection is complete. The Subcontractor will not be allowed to postpone restoration of the site until the end of the project.

PART 4 MEASUREMENT & PAYMENT

4.01 MEASUREMENT

A. Light Cleaning & CCTV Inspection

1. Light cleaning and mainline CCTV inspection shall be measured by linear foot by each diameter of mainline sewer inspected and documented in accordance with the specification.

B. Heavy Cleaning

1. Heavy cleaning shall be measured by linear foot of each diameter of heavy cleaning approved by the Program Manager and documented.

C. Remote Trimming of Protruding Service Lateral

1. Remote trimming of protruding service lateral that prevent a thorough inspection of the pipe will be measured per each.

4.02 PAYMENT

A. Mainline CCTV Inspection

1. Light cleaning and mainline CCTV inspection shall be paid for at the unit price for each linear foot of each diameter inspected and documented in accordance with the specification.

2. The unit price for Light Cleaning and Mainline CCTV inspection shall cover the entire cost of the required light cleaning and CCTV inspection and reporting in accordance with PACP V 6.0.1 format, including but not limited to labor, mobilization and access, CCTV equipment, recording media, traffic control, light cleaning of mainline sewer, documenting results in PACP records and logs, digital format recordings, photo equipment, power supply for equipment, interim and final reports and all other appurtenant work.

3. No additional payment will be made for:

   a. Re-inspection due to rejected inspection and/or records for any reason.

   b. Reversals.

   c. Performing excavation and associated sewer point repair to retrieve a stuck CCTV camera or hydraulic cleaning hose/nozzle.

   d. Incomplete electronic logs.

   e. Unapproved duplication of inspections: The Subcontractor is responsible to ensure duplications do not occur.

B. Heavy Cleaning

1. Heavy Cleaning shall be paid for at the unit price for CREW HOURS of each diameter of heavy cleaned sewers at the direction of the Program Manager and in accordance with the specification.

2. The unit price for Heavy Cleaning shall include the entire cost including but not limited to labor (regardless of crew size), mobilization and access, traffic control, appropriate disposal of sewer debris removed from sewer at permitted site and all other appurtenant work. Payment includes non-hydraulic jet efforts such as porcupines, cutters, power rodding, clam buckets, and other mechanical means, traffic control, and re-cleaning with hydraulic jet, labor, materials, and equipment necessary to clean mainline sufficiently to allow video reviewers a clear picture of pipe conditions.

3. No additional payment will be made for:

   a. Additional passes of heavy cleaning if the inspection observation reveals roots, grease or other debris remaining in the sewer after the heavy cleaning passes.

C. Remote Trimming of Protruding Service Lateral

1. Remote trimming of protruding service lateral that prevent a thorough inspection of the pipe will be measured per each.

4.03 PAYMENT WILL BE MADE UNDER:

Item No.	Pay Item	Pay Unit

02541-4.01.A	LIGHT CLEANING & MAINLINE CCTV INSPECTION FOR EACH DIAMETER	LF
02541-4.01.B	HEAVY CLEANING FOR EACH DIAMETER	CREW HOURS
02541-4.01.C	REMOTE TRIMMING OF PROTRUDING LATERAL	EACH

END OF SECTION 02541

LIST OF STREETS FOR 9:00 – 3:00 WORK ONLY

March 29, 2018

1. Germantown Pkwy (Wolf River to Hwy 64)
2. Poplar Ave. (I-240 to Kirby Pkwy)
3. Poplar Ave. (Perkins to I-240)
4. Lamar Ave. (Holmes to Winchester)
5. Ridgeway (Primacy Parkway to Poplar)
6. Park Ave. (Primacy Parkway to Massey)
7. Summer Ave. (Hwy 70) (Perkins to Sycamore View)
8. Shelby Dr. (Pleasant Hill to Mendenhall)
9. Walnut Grove (I-240 to Germantown Pkwy)
10. Walnut Grove (Perkins to I-240)
11. Hwy 64 (Appling to I-40)
12. Sycamore View (Summer Ave. to Macon)
13. Lamar (East Parkway S. to Airways)
14. Getwell (American Way to Park Ave.)
15. Park Ave. (Colonial to White Station)
16. Highland (Park to Walnut Grove)
17. Perkins (Park to Poplar)
18. Perkins (American Way to I-240)
19. Wolf River (Kirby to Germantown)
20. East Parkway (Poplar to Summer)
21. Covington Pike (Pleasant View to Summer)
22. Mendenhall (Park to Walnut Grove)
23. Bellevue (Union to Lamar)
24. Mullins Station (Farm to Appling)
25. Farm (Walnut Grove to Mullins Station)
26. Pauline (Union to Poplar)