

RESOLUTION NO. _____

A RESOLUTION ACCEPTING THE PROPOSAL OF LJA ENGINEERING, INC., FOR INSPECTION AND ENGINEERING SERVICES RELATIVE TO THE WEST KINGSPORT SEWER BASIN; AUTHORIZING THE MAYOR TO EXECUTE A PROFESSIONAL SERVICES AGREEMENT FOR THE SAME AND ALL OTHER DOCUMENTS NECESSARY AND PROPER TO EFFECTUATE THE PURPOSE OF THE AGREEMENT

WHEREAS, the west Kingsport sewer drainage basin has seen increased development over the past few years which necessitated assessments of the sewer systems capacity and condition; and

WHEREAS, based upon results of capacity and the flow monitoring assessments which were completed in early 2023 staff deem it prudent to further investigate in the Ridgefields area of the west Kingsport sewer basin where the highest instances of inflow and infiltration were identified; and

WHEREAS, this project will perform/provide manhole inspections, GPS survey and integration, smoke testing, CCTV inspection and cleaning, and engineering summary which will develop rehabilitation projects for the west Kingsport sewer basin; and

WHEREAS, staff recommends accepting the proposal from LJA Professional Services, Inc., and entering into a Professional Services Agreement with LJA Engineering, Inc., in the amount of \$190,638.00; and

WHEREAS, funding is available in SW2207.

Now therefore,

BE IT RESOLVED BY THE BOARD OF MAYOR AND ALDERMEN AS FOLLOWS:

SECTION I. That the proposal for the inspection and engineering services for the west Kingsport sewer basin from LJA Engineering, Inc. is approved.

SECTION II. That the mayor, or in his absence, incapacity, or failure to act, the vice-mayor, is authorized and directed to execute, in a form approved by the city attorney and subject to the requirements of Article X, Section 10 of the Charter of the City of Kingsport, the proposal for inspection and engineering services as well as a professional services agreement for the west Kingsport Sewer Basin from LJA Engineering, Inc., to deliver the agreement and take any and all action as may be required on the part of the city to carry out, give effect to, and consummate the transactions contemplated by the proposal as set out below and this resolution:

Mr. Chad Austin City of Kingsport
1113 Konnarock Road
Kingsport, Tennessee 37664

RE: Engineering Services as Related to the
Sanitary Sewer Inspection & Rehabilitation Project City of Kingsport, Tennessee
LJA Task Order 20240129 Dear Mr. Austin,

LJA Engineering, Inc. ("LJA") is pleased to provide this Task Order for engineering services associated with the Sanitary Sewer Inspection & Rehabilitation Project for the City of Kingsport ("Client"). This task order is made pursuant to the terms and conditions of the Professional Services Agreement ("PSA") entered into on November 28, 2022, by and between LJA Engineering, Inc. and the City of Kingsport.

Background

The Client is actively working through inflow/infiltration (I/I) correction measures within the sanitary sewer collection system. The Client previously retained LJA to assist with a temporary flow monitoring project within portions of the collection system to identify priority areas in which inspection and rehabilitation efforts should be focused.

The results of the study were presented to the Client and various approaches were discussed. LJA prepared several options to address I/I based on budget and timing. The results indicated that sanitary sewer evaluation survey (SSES) activities should be focused within specified areas of the system. The summary memo outlined the activities that should be completed during wet weather periods or where "wintertime" seasonal patterns are prevalent such that the observance of defects with extraneous flows could be identified. Following the identification of these defects, it was recommended that a rehabilitation project be formulated to address the required repairs. The Client requested the priority work be conducted within Basin 5438_12 which is approximately 100 manholes and 25,000 linear feet. (See Exhibit A)

Approach

It is expected that manhole inspections will begin immediately upon approval of this Task Order and be completed by the end of April 2024. The manhole wet weather inspections will be performed utilizing NASSCO defect criteria such that all defects can be relatively ranked and prioritized. The inspections will provide a condition assessment for each manhole and identify defects to be prioritized. It is critical that these inspections be performed during wetter periods to identify those contributing Rain-dependent inflow & infiltration (RDII) into the system since manhole/line connections are a typical inflow and infiltration (I/I) source. During the manhole inspection process, system connectivity and map verification is also performed which is critical for the next phases of work. Survey grade GPS coordinates will be taken at each manhole during the process of identifying system connectivity. It is imperative to have a corrected map prior to beginning any rehabilitation projects in order to minimize change orders and provide the most efficient repairs.

Smoke testing efforts will be completed during the summer of 2024, approximately between the months of May through June when groundwater levels are at the lowest. This will identify inflow type defects which contribute to the significant peaks observed with intense rainfall events. These type defects also significantly contribute to SSO events due to the quick response during intense storms. CCTV inspections are necessary to identify defects within mainlines and provide a means to formulate a rehabilitation design. Once completed, the CCTV inspection results are analyzed (coupled with the smoke testing and wet weather manhole inspection results) to finalize the priority ranking of work to be performed during rehabilitation.

Upon completion of all field work, LJA staff will compile the findings into a summary spreadsheet to provide a general indication of defects observed. LJA staff would integrate the associated reports from the SSES activities into the Client's current GIS and provide an updated GIS map layer. LJA would work with the Client's GIS staff to incorporate the updated layers into the Client's current GIS system.

The associated Scope of Services outline the tasks to be performed to meet the approach discussed in the above narrative.

Scope of Services

1.0 SSES Activities, Field Services Management, & GIS Integration

SSES field activities performed during this Task include the following with approximate quantities based on Client's current GIS:

- Manhole inspections (approximately 100) – Manhole inspections will be conducted during wet weather periods (~ February through April) to identify I/I sources. Data collected during manhole inspections will include the material of each manhole component (cover, frame, chimney, cone, wall, bench and invert) and will be based on NASSCO coding. The condition of each component will be assessed, defects identified, and pertinent photos will be taken. Additionally, connectivity will be verified with the GIS on each incoming and outgoing pipe segment such that map corrections can be made. A PDF report summarizing the information collected will be provided including photos. A sample is included in Exhibit B.
- GPS Surveying of Manholes (approximately 100) – A GPS survey of each manhole will be performed to obtain x, y, and z coordinates. Each point will be gathered with survey grade accuracy using a Trimble GPS data collector. Manhole GPS work will be performed during the wintertime period (between February through April) when the tree canopy is at a minimum. Any manholes where

survey grade accuracy cannot be obtained will be collected with mapping grade accuracy (+/- 3 feet). At the time a model is formulated utilizing the GPS data, other survey means will be utilized as part of that effort to obtain survey grade data for any locations required. LJA staff will coordinate with the Client to integrate the GPS data and revised sanitary sewer layer into the Client's existing GIS mapping system.

- Smoke testing (approximately 25,000 LF) – Smoke testing will be conducted to identify cross connection defects and severe inflow sources. These activities will be conducted during drier periods of the year (~ May through June) when ground conditions are dry allowing the smoke to permeate through the soil and into the air. Strategic smoke testing points will be identified throughout the project area to accommodate approximately 600-800 foot stretches of sewer mainline. While smoke is being pushed through the mainlines by a smoke blower, GPS points will be taken of each observed defect where smoke is exiting the ground. A photo will be taken of each defect and logged with the associated data collected. A summary report of each segment will be provided detailing the type of leak observed and an aerial map of the marked location. A sample is provided in Exhibit B.

In order to facilitate the field work listed above, LJA staff will perform the following:

- Provide oversight and direct management of subcontractors working on the project performing the above activities including scheduling, coordinating with the Client, coordinating during specific weather periods.
- Track progress throughout the project and provide updates to the Client as requested, including evaluating production logs and "cannot locate" lists for manholes. LJA staff will coordinate with subcontractor and the Client to get necessary access/manholes raised to facilitate work.
- A professional licensed surveyor (PLS) will validate any GPS shots taken to verify accuracy and ensure the points are imported into ESRI platform to be used in the Client's current GIS layer.
- Track progress during the smoke testing phase and provide updates to the Client as requested. Any significant findings will be submitted to the Client as they are identified.
- Perform various site visits during field activities.
- Conduct interim meetings/progress meetings with the Client during work to provide updates and discuss project progress and details.

Throughout the course of each field activity, LJA staff will receive preliminary data cuts of the database deliverable to ensure data is being collected properly, perform QA/QC checks, and verify accuracy. As each type of field work is completed, LJA staff will receive a final database submittal and perform a final review of the information collected. Upon receipt and final review of each dataset, LJA staff will integrate the data collected within the Client's current GIS layer. Using any GPS data collected, LJA staff will initially create the geometric network within the GIS to provide connectivity from manhole to manhole throughout the project area and enable the ability to perform tracing functions within ESRI. The manhole reports and individual data will be linked to each associated manhole within the manhole shape file. The smoke testing reports and individual data will be linked to each associated mainline segment within the sewer line shape file. LJA staff will compile the digital information and create point and linear defect events in personal geodatabases that will contain all the data to be served and queried within the GIS. Specific information about the defect such as type, location and severity score will be available in tabular format via the "Identify Tool" of ArcGIS. LJA staff will provide the Client with a final layer set to be imported into current GIS system. The final layer will contain links to each manhole and smoke testing report submitted.

Upon finalization of the GIS integration, LJA staff will compile the findings and create a list of priority mainline segments to be CCTV inspected. A map book will be created in PDF format, with index pages and map numbering, to be provided to the CCTV subcontractor to complete inspection work. An associated listing of each segment will also be exported from the GIS layer to create an Excel spreadsheet which will also be provided to the subcontractor to be used during the project to facilitate work.

2.0 CCTV Surveys, Field Services Management, & GIS Integration

It is anticipated that approximately 25,000 linear feet will be inspected. Preconditioning (cleaning) will only be conducted when needed. It is not expected that each pipe will need to be cleaned prior to inspections. A budgeted quantity of 60% of the inspected footage will be used for segments to be cleaned. However, this footage is a budgetary number and the segments that need to be cleaned in order to complete the work will be cleaned.

Of the pipe segments on the priority CCTV inspection list, only those mainlines requiring cleaning will be cleaned. It is expected that up to 60% (~15,000 LF) of the mainlines inspected may require preconditioning prior to inspection and 20% (~5,000 LF) of the mainlines may require heavy cleaning. However, should the pipes have a significant amount of debris, the totals could be higher. The projected footage to be cleaned and associated fees are only estimates. Should more cleaning be

required than anticipated, fees will need to be increased appropriately or an associated reduction in scope for the inspection will be necessary. Although the service lateral connections within the mainline will be visible during the mainline inspections, the inspection of each individual service lateral via a lateral launch will not be included as part of the scope of this project. It will be required to inspect each lateral included in the rehabilitation project at the time of construction to verify final rehabilitation once that data becomes available.

CCTV mainline inspections will be performed utilizing NASSCO standards. The camera will stop and pan each defect and tap to record pertinent information. Pre-conditioning of the pipe will be performed as needed to obtain an unobstructed view of the pipe. Heavy cleaning may be required to remove roots, heavy debris/silt, or remove protruding taps. It is estimated/budgeted that approximately 20% of the pipelines will require heavy cleaning. This is only an estimate. Should the actual footage requiring heavy cleaning be higher than the estimated amount, additional monies would be required to complete the work or work would need to be eliminated accordingly. A log will be provided that indicates the footage inspected, the footage preconditioned, and the footage heavy cleaned. A PDF report will be created from the inspection summarizing each item observed along with pictures.

In order to facilitate the CCTV inspections listed above, LJA staff will perform the following:

- Provide oversight and direct management of subcontractors working on the project performing the above activities including scheduling, coordinating with Client, coordinating during specific weather periods
- Track progress throughout the project and provide updates to Client as requested, including evaluating production logs and manholes that have been located and marked for Client to raise.
- Perform various site visits during field activities.
- Conduct interim meetings/progress meetings with Client during work to provide updates and discuss project progress and details as needed.

Throughout the course work, LJA staff will receive preliminary data cuts of the database deliverable to ensure data is being collected properly, perform QA/QC checks, and verify accuracy. As field work is completed, LJA staff will receive a preliminary database submittal and perform a review of the information collected. Upon receipt and final review of each dataset, LJA staff will integrate the data collected within the GIS layer. LJA staff will compile the digital information and create point and linear defect events in personal geodatabases that will contain all the data to be served and queried within the GIS. Specific information about the defect such as type, location and severity score will be available in tabular format via the "Identify Tool" of ArcGIS. LJA staff will provide Client with a final layer set to be imported into Client's current GIS system. The final layer will contain links to the associated inspection report.

3.0 Engineering Summary of Findings

Upon finalization of the GIS integration, LJA staff will perform a general prioritization for each sewer mainline segment, taking into account each SSES activity completed. This summary of information will be shown in ESRI ArcGIS via symbology based on severity of defects or I/I observed. LJA staff will provide a summary spreadsheet with defects prioritized based on the NASSCO scoring system. LJA staff will present the findings to Client staff and discuss the criteria used during the evaluation. LJA staff and Client staff will jointly review the results and findings and discuss steps to perform the next phase of work (rehabilitation).

LJA staff will provide a summary GIS dataset that can be incorporated into Client's existing GIS network. LJA will coordinate with Client's GIS department to facilitate the delivery.

Client's Responsibilities

Client shall be responsible for the following items:

- Provide assistance and coordinate with property owners as needed for property access.
- Assist LJA staff by locating manholes not easily identified both above and below grade.
- Provide access to buried manholes that are below grade (raising manholes to facilitate entry).
- Provide water at no charge during cleaning and CCTV inspections. Contractors will provide an accounting of water used for water loss purposes.
- Provide access at the WWTP to offload debris from the Vac-truck during cleaning and inspections.
- Allow CCTV inspections to be performed during Monday through Saturday if needed to ensure deadlines are met.

Compensation

We propose to provide the specific services described above to be billed as follows:

Task 1.0 SSES Activities, Field Services Management, & GIS Integration

Item No.	Description	Units	Unit Cost	Total
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1a.	Manhole Inspections	100	\$165	\$16,500
1b.	Manhole GPS	100	\$55	\$5,500
1c.	Smoke Testing	25,000	\$0.65	\$16,250
1d.	Engineering/GIS integration Field/Management	LS	\$15,250.00	\$15,250
Sub-Total Task 1				<u>\$53,500</u>

Task 2.0 CCTV Inspections, Field Services Management, & GIS Integration

Item No.	Description	Units	Unit Cost	Total
2a.	Mobilization	1	\$4,200	\$4,200
2b1.	CCTV Inspection 6-inch to 8-inch	19,100	\$1.93	\$36,901
2b2.	CCTV Inspection 12-inch	3,500	\$2.03	\$7,098
2b3.	CCTV Inspection 15-inch	2,400	\$2.12	\$5,098
2c1.	Preconditioning 6-inch to 8-inch	11,460	\$2.07	\$23,745
2c2.	Preconditioning 12-inch	2,100	\$2.17	\$4,563
2c3.	Preconditioning 15-inch	1,440	\$2.27	\$3,274
2d1.	Heavy Cleaning Adder to Preconditioning 6-inch to 8-inch	3,820	\$1.40	\$5,363
2d2.	Heavy Cleaning Adder to Preconditioning 12-inch	700	\$1.54	\$1,075
2d3.	Heavy Cleaning Adder to Preconditioning 15-inch	480	\$1.75	\$841
2e.	Reverse Setup	15	\$210	\$3,150
2f.	Locate, Sonde, Mark MH	10	\$158	\$1,580
2g.	CCTV Reports and Data Delivery	LS	\$6,000	\$6,000
2h.	Engineering/GIS CCTV & Management	LS	\$18,750.00	\$18,750
Sub-Total Task 2				<u>\$121,638</u>

Task 3.0 Engineering Summary of Findings

Item No.	Description	Units	Unit Cost	Total
3	Engineering Reporting	LS	\$15,500.00	\$15,500

Total Not-to-Exceed

\$190,63

Any work not authorized within three (3) months of the date of this agreement will be subject to renegotiations based on current rates.

Schedule

LJA staff would tentatively schedule to begin manhole inspections and manhole GPS work immediately upon approval. It is anticipated the manhole inspections will take approximately 4-5 weeks to complete pending weather conditions. CCTV inspections will begin within 2-3 weeks of authorization. It is anticipated that CCTV inspections will take approximately 3-4 weeks to complete the field portion of the work. It is anticipated that smoke testing would begin in the when groundwater conditions are at the lowest. Timing to complete smoke testing would tentatively be between May 2024 and June 2024. It is anticipated that smoke testing would take approximately 2 weeks to complete pending weather conditions. Upon completion of all field work, LJA staff will present the findings and discuss the recommendations for the rehabilitation project and design parameters. LJA staff will then coordinate with the Client to determine the tentative schedule for advertisement and bidding of the project.

Reimbursables and additional services

Included in the above fees are reimbursable expenses incurred on the project's behalf, including: mileage, printing, plotting, photocopies, reproduction, express mail, and/or courier services. Any regulatory agency review fees associated with plan reviews shall be the responsibility of the Client. Reimbursable expenses will be billed at cost plus ten percent (10%). LJA will bill monthly for all work performed and expenses incurred on the project's behalf. Unpaid invoices after thirty (30) days will accrue service charges at 1-1/2% per month and include any costs of collections and reasonable attorney's fees.

Authorization

If this proposal meets with your approval, your signature below and on the attached Professional Services Agreement will be sufficient authorization for LJA to commence the stated work as indicated in the above Scope of Services.

We appreciate the opportunity to submit this proposal and look forward to working with you on this project. If you have any questions, please contact me at 931.273.8999.

[Acknowledgements Deleted for Inclusion in this Resolution]

SECTION III. That a Professional Services Agreement with LJA Engineering, Inc. for the inspection and engineering services for the West Kingsport Sewer Basin, is approved.

SECTION V. That the mayor is further authorized to make such changes approved by the mayor and the city attorney to the agreement that do not substantially alter the material provisions of the agreement, and the execution thereof by the mayor and the city attorney is conclusive evidence of the approval of such changes.

SECTION VI. That the board finds that the actions authorized by this resolution are for a public purpose and will promote the health, comfort and prosperity of the citizens of the city.

SECTION VII. That this resolution shall take effect from and after its adoption, the public welfare requiring it.

ADOPTED this the 19th day of March, 2024.

PATRICK W. SHULL, MAYOR

ATTEST:

ANGELA MARSHALL, DEPUTY CITY RECORDER

APPROVED AS TO FORM:

RODNEY B. ROWLETT, III, CITY ATTORNEY