SUPPLEMENT NO. 5
TO
ENGINEERING SERVICES AGREEMENT
FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS
BETWEEN
THE CITY OF LAWRENCE, KANSAS AND
TREKK Design Group, LLC
FOR
TREKK Design Group, LLC FOR UT1305 Rapid I/I Reduction Project

The purpose of this Supplement No. 5 is to define additional engineering services requested by the City of Lawrence, Kansas, hereinafter called the Owner, to be provided by **TREKK Design Group, LLC.**, hereinafter called the Engineer, for the Rapid I/I Reduction Project contract. This agreement is a supplement to the ENGINEERING SERVICES AGREEMENT FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS BETWEEN THE CITY OF LAWRENCE, KANSAS AND **TREKK Design Group, LLC.**, dated July 22nd, 2013.

SECTION I – SCOPE OF SERVICES

Under the terms of Supplement No. 5, the Owner and Engineer agree to modify the scope of services to include additional engineering services in connection to Phase 6 of the Rapid I/I Project as described in the attached: *Exhibit A to Supplement No. 5 Agreement for Professional Engineering Consulting Services (Phase 6 Scope of Services).* Additional services for the Phase 6 scope of work total $619,742.

SECTION II – COMPENSATION

A change in compensation for the revised services as described in Supplement No. 5, the Owner agrees to increase the pay to the Engineer an amount equal to the Engineer's salary billings plus reimbursable expenses at cost, and subcontract billings at cost times multiplier, by $619,742.

The total previous maximum billing limit for the Rapid I/I Reduction Project, including Supplement No. 1, Supplement No. 2, Supplement No. 3, and Supplement No. 4 shall be increased to $4,206,633 as a result of this Supplement No. 5.

Billing rates, procedures and all other items pertaining to compensation are as described in the attached: *Exhibit B to Supplement No. 5 2018-2019 Schedule of Hourly Billing Rates Phase 6 – Rapid I/I Reduction Project.*

SECTION III – OTHER MATTERS

It is mutually agreed and understood that all terms of the original Agreement, not specifically revised by Supplement No. 1, Supplement No. 2, Supplement No. 3, Supplement No. 4, or Supplement No. 5 shall remain unchanged and in full force.

IN WITNESS WHEREOF, the parties have executed this Supplement No. 5 on this _____ day of _____, 2018.

City of Lawrence, Kansas
Owner

By_____
Thomas M. Markus

Title City Manager

Date _____

TREKK Design Group, LLC
Engineer

By _____
Kimberly Robinett

Title Managing Partner

Date 8/21/18

Approved As to Form

By_____
Toni Ramirez Wheeler

Title City Attorney

Date _____

EXHIBIT A
TO
SUPPLEMENT NO. 5 TO ENGINEERING SERVICES AGREEMENT

Owner: City of Lawrence, Kansas
Engineer: TREKK Design Group LLC
Project: UT1305 Rapid I/I Reduction Project

DESCRIPTION OF SCOPE OF SERVICES
(PHASE 6 SCOPE OF SERVICES)

TREKK will furnish the necessary labor, supervision, equipment and material to provide the inflow and infiltration (I/I) investigation of the Phase 6 – Rapid I/I Reduction Project. Phase 6 work will consist of internal and external plumbing evaluations on approximately 1,258 buildings. Inspection of public sector manholes and sewer mains will be conducted on an on-call basis and limited to high priority isolated areas that the City may encounter. Comprehensive inspection of public manholes and sewer mains in the Phase 6 area will be conducted at a later date under a separate contract. Recommendations will be made for public and private sector improvements to reduce inflow in the sanitary sewer system.

Task 1 – Project Management and Administration

Project Administration and Kick-off Meeting – The City's Project Manager, will be kept informed of our progress via email updates throughout the course of the project. TREKK will meet with the City staff during an initial "kick-off" meeting. The purpose of the initial meeting will be to discuss the City's project goals and objectives, establish project limits, review inspection format and forms and project deliverables, including incorporating the City's CMMS, Lucity, and the City's ArcView GIS software. All interested parties would be requested to attend this meeting, including the street and police departments to discuss traffic control issues and procedures.

During the Project, TREKK will participate in monthly (10) progress meetings. During the monthly meetings, a "Project Update" memo will be distributed to interested and involved parties. The memo would include:

- Progress to Report This Period (including updated invoicing, budget and payments)
- Contract Issues
- Progress Anticipated Next Period
- Issues Resolved
- Issues Unresolved

Task 2 – Phase 6 Private I/I Abatement Program

Private I/I Administration - TREKK will assist the City with the administration of the Private I/I Program. Weekly meetings will be conducted with City personnel to coordinate plumber work assignments and progress. TREKK will create work orders for all repairs and distribute to assigned plumbers. All repair activities will be recorded and tracked in the Ecoflow GIS module created for the Ecoflow program. TREKK will collect and log comments received from property owners.

Assist with Refinement of Public Outreach Program - TREKK will work with the City and assist in developing and refining the existing public outreach program. This includes identifying opportunities for public notification, public education, and promoting the Ecoflow Program. TREKK will assist the City in developing program materials such as signage, brochures, web sites, and promotional videos.

Conduct Open House Meetings (2) – TREKK will assist with coordination and conducting Open House Meetings in the private I/I sub-basins to inform and consult the public about the Ecoflow Program. Up to two (2) meetings shall take place. The City will secure the meeting space and room set up. TREKK shall arrange for refreshments, prepare display boards and provide any handouts needed for the workshops. TREKK will answer questions from the public during the meetings and schedule building evaluation appointments on site.

Plumbing Evaluations up to 1,048 Private Properties (Approx. 1,122 addresses) - Smoke testing cannot locate and confirm all I/I defects on private property. For this reason, comprehensive plumbing evaluations will be conducted of all buildings located within the Study Area to identify sources of I/I entering the sewers. Advance notification to residents will be mailed by the City and placement of door hangers on homes and businesses by TREKK prior to the open house meetings. The evaluation will be conducted by a two-person inspection team. An attempt will be made to obtain the history of basement flooding as reported by the owner or occupant. This will include detailed information such as flood dates, duration, suspected cause and action taken by owner or occupant. Both an internal inspection and an external inspection will then be conducted. Internal inspections will include the investigation of storm water connections discharging to the sanitary sewers through floor drains and/or sump pumps. An external inspection will include the investigation of storm water connections from downspouts, uncapped clean outs, driveway drains, area drains and/or stairwell drains.

Plumbing evaluations will be scheduled through a phased approach. The first attempt will be made with a mailed notice requesting the property owner to call and schedule a date and time for the evaluation. The second attempt will be made through a phone call (up to 3 attempts). If contact cannot be made through a phone call, crews will go door-to-door in an attempt to complete the inspections. In the event that contact cannot be made by knocking on doors, a door notification shall be provided listing a contact phone number to schedule an appointment. If after the third attempt the resident is unresponsive, it shall be noted as “not inspected.” This shall be considered as the final attempt.

The City will provide property owner information for the Study Area.

All plumbing evaluation data will be digitally recorded on standardized forms and input into Lucity as the work progresses.

Private Sector Dyed-water Testing (75) - Private sector dye-testing will be performed on up to seventy-five (75) locations to verify connectivity on suspect illicit connections not confirmed through the building inspections or smoke testing.

Private I/I Disconnect Program (337) - It is assumed that building inspections will identify up to 337 properties with illicit connections to the sanitary sewer. TREKK will notify property owners on up to three (3) separate occasions of the illicit connections. TREKK shall make up to 337 phone calls (approximately 15 minutes each) to discuss the program and provide information to the

property owners and assist the plumbing contractors with scheduling an onsite consultation. In addition, TREKK will assist the authorized plumbing contractors by providing contact information and detailed information pertaining to the disconnection of the illicit connections as identified through building evaluations and deemed to be cost effective. Up to 337 phone calls with plumbing contractors (approximately 15 minutes each) and up to 337, 45 minute on-site consultations with plumbing contractors and property owners will be conducted. TREKK shall conduct verification of the final disconnection and ensure that the property owner is completely satisfied with the remediation efforts. TREKK will utilize the Ecoflow GIS module and Lucity to update and track the Private I/I disconnect program as the work progresses.

Previous Phase Plumbing Evaluations up to 125 Private Properties – Conduct plumbing evaluations in areas outside of the current project areas that may arise.

Previous Phase Private I/I Disconnect Program up to 38 Buildings – Facilitate the disconnection and repair process of I/I sources in areas outside of the current project area that may arise.

Post Private I/I Abatement Assessment - Following completion of the Phase 6 Private I/I Disconnect Program, TREKK will conduct a review of the work flow processes, success rates of plumbing evaluations, density and severity of I/I defects, success rates of defect disconnections, and a private I/I cost benefit analysis. In addition, TREKK will reach out to all plumbing contractors near the completion of Phase 6 to gain input and feedback on the Program repair process. Questions will be asked regarding the overall Program, repair process, public perception, and ideas/recommendations for improvement.

Update Private I/I Disconnect Protocols – Updates to the Private I/I Program and appropriate work flow processes and protocols will be made based on discussions and feedback from the City during the course of the project.

Data QA/QC – Monthly QA/QC checks will be completed within the Lucity and Ecoflow GIS module to ensure the integrity of the evaluation and disconnection data. Checks for missing data, inconsistent data, photos, etc. will be completed.

Task 3 – On-Call Public I/I Investigations

Inspection of public sector manholes and sewer mains will be limited to any high priority isolated areas that the City may encounter and will be done on an on-call basis. Comprehensive inspection of public manholes and sewer mains in the Phase 6 area will be conducted at a later date under separate contract. The following public sector inspection may be completed on an on-call basis.

Manhole Inspections – Manhole inspections will be conducted by two-person crews. All manholes will be inspected along with capturing 360 camera imaging data. Manholes will be inspected from the top-side of the manhole using the TREKK360 camera. Each structural component of the manhole will be inspected and assigned a NASSCO MACP condition rating. An initial rehabilitation recommendation will be provided by the technicians during the inspection. Photographic records will be used to supplement and substantiate manhole inspection observations and recommendations. All manhole inspection data will be digitally recorded in Lucity as work progresses.

A list and general vicinity of manholes that could not be inspected because they were buried or crews were unable to locate will be tabulated on a daily basis and provided to the City's utility's department to be located and uncovered. TREKK will then follow-up with an inspection of the manhole.

Traffic safety precautions will be followed at all times and all field technicians will wear safety vest or work shirts that are designed for high visibility to allow for greater protection for themselves and the public.

Smoke Testing – Smoke testing will be conducted on all line segments located within the Study Area to identify I/I sources from both the public and private sector. Each positively identified source is photographically documented, precisely located and referenced to allow for efficient repair.

The high rated smoke blowers combined with the use of liquid smoke allow for continuous and constant smoke production while the field crew canvasses the areas over and adjacent to the lines and conduct a perimeter check of all buildings in close proximity for evidence of smoke.

Smoke testing activities will include a minimum of 48 hours advance notification to all residents within the study areas. Notification will be done by placement of door hangers on homes and businesses. The notice will include general information about the testing; including instructions to fill infrequently used plumbing traps with water and a tablespoon of cooking oil to prohibit smoke from entering buildings via service lines. Additionally, daily notification of smoke testing boundaries will be provided via facsimile to Fire Dispatch, City Utilities and other designated personnel as determined in the Project Kick-off Meeting.

Photographic records will be used to supplement and substantiate smoke testing observations. All smoke testing inspection data will be digitally recorded in Lucity as the work progresses

Dye Water Testing - Follow-up dyed water testing of suspected I/I sources identified during the smoke testing will be performed to verify direct connection to the sanitary sewer system and quantify leakage. A fluorescent dye will be washed down any suspected I/I connection. This will be accomplished by placing the dye directly into the identified source and running an adequate amount of water to ensure that the dye has a sufficient amount of time to be observed in the downstream manhole. Presence of dyed water in the system downstream of the test verifies the I/I source connection.

Public dye water testing shall be conducted in conjunction with the CCTV Inspection of the sanitary sewer main lines, as described herein.

Photographic records will be made of each confirmed source identified during dyed water testing. All dye water testing inspections will be digitally recorded in Lucity as the work progresses.

CCTV Inspection of Sanitary Sewer Main Lines - Pipe cleaning and internal television (CCTV) inspections will be completed on a list of line segments provided by the City. CCTV inspections will be conducted utilizing a camera with pan and tilt capabilities. The pulling or pushing cable or tractor unit shall have a footage meter so that the location of the TV camera and point of observation will be known at all times with reference from the starting manhole. The camera shall pan to all service connections to allow for the evaluation of the condition of the connection and to view inside the service connection. The camera shall also pan to significant structural defects and/or I/I sources. The direction of the camera will be noted. The display will always begin with the numbering from upstream manhole to downstream manhole. If a reverse setup is attempted,

the same numbering system shall be used; however the direction of camera shall be switched. In the event that an unrecorded manhole is encountered, television inspection will halt. A new manhole number will be assigned (i.e.: line segment 2-1 will become 2-2a and 2a-1). These changes will also be noted on maps and lists provided and submitted to the City at the conclusion of project work.

The camera shall be a self-leveling type and moved through the sanitary sewer line in either direction at a uniform rate, stopping when necessary to insure proper documentation of the sewer condition and lateral connections, but in no case will the television camera be pulled at a speed greater than 30 feet per minute. If, during the inspection operation the television camera will not pass through the sewer line due to a Level 4 or Level 5 defect, according to NASSCO codes, the technician shall notify the City and end the inspection. The inspection will resume upon repair of the defect by the City. If, during the inspection operation the television camera will not pass through the sewer line due to an obstruction that cannot be removed through light cleaning of the sewer, the technician shall reset his equipment in a manner so that the inspection can be performed from the opposite direction. If, again, the camera fails to pass through the entire sewer, the location and cause of camera blockage will be documented and information provided to the City. The inspection shall be considered complete and no additional inspection work will be required.

All informational data on the pipes will be collected in a NASSCO PACP format that is importable to the City's POSM software and delivered in hard copy and portable digital format to the City at the conclusion of the project. Computer generated television inspection reports created with Granite XP Software, or similar pipeline condition software, will be produced at the conclusion of the job and submitted with the videos. Reports will contain upstream manhole, downstream manhole, street address, date, pipe diameter, pipe material, direction of inspection, line footage, lateral and observation locations, and digital photos of defects and their respective severity.

Public I/I Summary – TREKK shall provide a summary of the Public I/I field investigations. TREKK will compile a list of each defect identified from manhole and smoke testing inspections. Defects shall then be prioritized based upon severity, structural integrity, safety and severity of I/I. A summary listing of each specific I/I defect will be completed and will include the following:

- Source type
- Source category (public sector, private sector)
- Number of such sources
- Source unit repair cost
- Total repair cost for such sources

Task 4 – Programmatic Flow Reduction Review

RDII and Flow Reduction Review – In order to establish the effectiveness of current I/I control measures on peak wet and dry weather flows, TREKK will complete flow data analysis as discussed in the following sections. Flow data analysis will be conducted on flow data provided by the City.

Wet weather flows for each significant rainfall event will be analyzed to determine the peaking factors and RDII that enters the collection system. By comparing the storm event peak flow with the dry weather flows, TREKK will establish the peaking factors for each storm. Relationships

between rainfall totals and peaking factors for each site will be plotted and trend lines will be determined. Peaking factors for the 1 inch, 2 inch and 3.95 inch (10-yr) will be calculated. The 10-yr peak RDII will then be projected using the appropriate peaking factor. This method of analysis is similar to that completed as part of the wastewater master plan.

Task 5 – Phase 6 Summary Report and Future Scoping

Summary of Phase 6 Activities Report - TREKK will prepare a report summarizing all Phase 6 activities, findings, results and the amount of I/I removed to date. The City will provide data regarding I/I and the observed removal rates. Recommendations will be made for Phase 7 work.

Review of Phase 6 Activities Report and Future Planning Meeting - TREKK will meet with the City to review and discuss the Phase 6 Summary Report and recommended schedule for future studies, rehabilitation projects and post-rehabilitation analysis.

Phase 7 Planning and Scoping – TREKK shall prepare a detailed scope of work and fee estimate for Phase 7 work. At the City's request, TREKK will attend meetings with the City Manager and City Commission as necessary.

Exhibit B
To Supplement No. 5
2018-2019 Schedule of Hourly Billing Rates[1]
Phase 6 – Rapid I/I Reduction Project
City of Lawrence, KS
(CITY)
TREKK Design Group, LLC
(ENGINEER)

Project Services: **ENGINEER** shall be available for professional engineering services for tasks such as, but not limited to, Flow Monitoring, Monitoring, Manhole Inspections, Smoke Testing, Building Inspections, Service Lateral Inspections, Main Line CCTV Inspections, Reporting, Rehabilitation Recommendations, Surveying, Construction Inspection, and Meetings at the request of the **CITY**.

The CITY's payment to the **ENGINEER** shall be due and payable as follows:

I. For Engineering Services, Plan Review, Surveying, Construction Inspection, and Meetings, when authorized and agreed upon in writing, an amount based upon hourly rates plus expenses, in accordance with Section III below, or a negotiated amount as agreed upon.

II. For **Other Services**, when authorized and agreed upon in writing, an amount based upon hourly rates plus expenses or unit rates, in accordance with Section III below, or a negotiated amount as agreed upon.

III. Hourly Rates and Expenses:

Project Principal	$180.00/hr - $225.00/hr
Project Manager	$99.00/hr - $220.00/hr
Assistant Project Manager	$99.00/hr - $206.00/hr
Asset Manager	$115.00/hr - $165.00/hr
Project Engineer I	$115.00/hr - $185.00/hr
Project Engineer II	$75.00/hr - $120.00/hr
Office Technician I	$90.00/hr - $125.00/hr
Office Technician II	$70.00/hr - $95.00/hr
Office Technician III	$40.00/hr - $75.00/hr
Senior Administration	$75.00/hr - $130.00/hr
Administration	$40.00/hr - $82.00/hr
Field Operations Manager	$90.00/hr - $140.00/hr
Field Manager	$85.00/hr - $115.00/hr
Field Technician I	$70.00/hr - $105.00/hr
Field Technician II	$60.00/hr - $75.00/hr
Field Technician III	$40.00/hr - $65.00/hr
GIS Analyst I	$75.00/hr - $140.00/hr
GIS Analyst II	$55.00/hr - $85.00/hr
Land Surveyor (RLS)	$105.00/hr - $128.00/hr
Survey Crew	$155.00/hr
Mileage	$00.54/mi
Out-of-Pocket Expenses, Supplies Reproductions, etc.	Cost

Unit Rates:

Description	Units	Cost per Unit
Manhole Inspections	Each	$80
Manhole Inspections w/ 360 Observation	Each	$110
Smoke Testing	Linear Foot	$0.45
Dyed-Water Testing (Public)	Each	$450
Light Cleaning and CCTV Inspections (8-12")	Linear Foot	$2.25
Light Cleaning and CCTV Inspections (15-30")	Linear Foot	$2.85

Light Cleaning and CCTV Inspections (33-48")	Linear Foot	$3.60
Light Cleaning and CCTV Inspections (>54")	Linear Foot	$4.75
Heavy Cleaning	Hour	$250
Easement Machine	Hour	$150
Cut Protruding Tap	Each	$225

IV. For the Phase 5 – Rapid I/I Reduction Project, the **Total Project Fee** shall not exceed **$619,742** as outlined below:

Task 1: Project Administration and Kick-off Meeting $42,376

Task 2: Phase 6 Private I/I Abatement Program..... $483,956

Task 3: On-Call Public I/I Investigations $40,438

Task 4: Programmatic Flow Reduction Review $8,688

Task 5: Annual Program Summary Report $44,284

Note 1: The above hourly rates and unit prices are good through December 31, 2019.