KING ENGINEERING ASSOCIATES, INC.

SUPPLEMENTAL #2 WORK ORDER INITIATION FORM for the CITY OF CLEARWATER

Date:	**August 14, 2018**
Project Number:	**2110-211-001**
City Project Number:	**13-0016-UT**

1. PROJECT TITLE:

East WRF Influent Pump Station Rehabilitation - Supplemental Work Order #2 for Rehabilitation of the Influent Sewer and Other Miscellaneous Improvements.

2. SCOPE OF SERVICES:

Background

Work Order (WO) (13-0016-UT) was issued to King Engineering Associates, Inc. (Consultant) in June 2013 to provide design and construction services related to rehabilitation and improvements to the existing Influent Pump Station (IPS). At about the same time, the City issued a WO for improvements to the effluent filters at the East WRF. This WO considered constructing the IPS improvements with the filter improvements under the same construction contract.

When the original IPS WO was issued, the City was unaware that two critical influent sewer structures, which are shown on the Record Drawings and are needed for bypassing sewage around the IPS, had not been constructed. This finding in February 2014 stopped design work on the IPS improvements to allow alternatives to be considered. The City subsequently decided that a new sewer structure should be constructed over the existing influent sewer. Engineering services related to the new sewer structure were included in a Supplemental Work Order (SWO) for the effluent filters project (13-0014-UT) in June 2014 since other supplemental work had been identified for the filters. Later, after the effluent filter SWO was issued, the City decided to

postpone the IPS project and continue design and construction of the effluent filter rehabilitation so as to not delay the effluent filter project unnecessarily.

The City then discovered in April 2015 that the existing influent sewer to the East WRF had deteriorated and needed to be repaired/replaced. As a result, the City decided to repair the sewer and relocate the new influent sewer structure as close as possible to the SR 60 right-of-way to maximize the length of sewer being replaced. To accomplish this, in December 2015 the City issued SWO #1 for the East WRF Influent Pump Station Rehabilitation for the Consultant to provide engineering services for the design of repairs to the existing influent sewer, re-locating the sewer structure, and for performing other work not included in the original IPS WO or in the SWO for the effluent filters.

SWO #1 for the IPS included Subsurface Utility Engineering (SUE) services needed to locate the existing 36-inch effluent pipe from the Northeast WRF, which was shown on Record Drawings to be located near the proposed sewer structure. An attempt to locate the Northeast effluent pipe in January 2016 was unsuccessful. Other priorities at the City delayed resolving this issue and moving the project forward. A second SUE investigation was conducted in June 2018. This investigation found the pipe to the south of the IPS but lost the pipe before it turns to the east.

Scope of Services

The City has requested that the Consultant provide evaluations and recommendations regarding the following items, not included in the original scope of services:

- Repair/replacement of the non-working influent flowmeter (magmeter);
- The disposition of the wet well baffle shown in the Record Drawings.
- Additional SUE services to locate the Northeast WRF effluent line as it enters the East WRF site.
- Geotechnical investigations for the proposed sewer structure.

In addition, because a temporary bypass pumping system is needed for the proposed work, the City has decided that other improvements should also be made while the IPS is out of service. To this end, Consultant will provide additional engineering design services for:

- Design of a new wet well air inlet to improve fresh air movement across the width of the wet well and reduce stagnant areas where corrosive gasses collect and contribute to concrete corrosion.
- Design of a gantry crane to facilitate removal of the headworks screens to prevent overflows should the screens become clogged during high flow or during emergency flow events.
- A new FOG breakup spray water system in the IPS wet well.
- Miscellaneous other improvements including:
  - Inclusion of an alternative concrete coating systems specification.
  - Replacement of the existing IPS check valves (#1 & #2) and isolation valves.
  - Safety nets in the IPS hatch openings.

- Chains on the IPS pumps for lifting.
- A hose bib at IPS operating platform.

This SWO #2 also provides compensation to the Consultant for:

- Updating the project's cover, title block and specifications to the City's standards, which have revised since issuance of the original Work Order in 2013;
- Updating the Engineer's Opinion of Probable Construction Costs based on current market conditions; and,
- Attending three project re-boot meetings.

The design of the proposed new sewer structure, which was included in the East Filter Rehabilitation SWO #1 project, has not been completed and the associated Purchase Order has been closed by the City. The fees for completing this work are incorporated into this SWO #2 as are payments not made to the Consultant resulting from a City billing error for work already completed.

Finally, Consultant shall provide additional bidding assistance, commensurate with the increase in project scope. A Health and Safety Plan shall also be provided.

I. PRE-DESIGN PHASE

Task 1.1 - Project Coordination

Consultant will provide additional Project Coordination services resulting from the extended project design schedule and the additional work described above including:

- Coordinating the activities of the Consultant's staff and subconsultants with those of the City and administering communications among the project team members and with the City's staff.
- Maintaining and updating monthly project schedules and status reports, using the City's forms.
- Administering a quality assurance program covering the technical work of the project team.
- Assisting the City's Project Manager with tracking project activity.
- A Health and Safety Plan will be prepared, submitted, and approved by the City Project Manager prior to mobilizing to the site.

II. DESIGN EVALUATIONS PHASE

Task 2.1 – Influent Flow Meter Evaluations

Consultant will provide a written evaluation of the existing influent magnetic flowmeter and the existing Parshall Flume flowmeter. These evaluations will include:

- Obtain information and data on the existing meters, if available, including manufacturer, make, model, installation, and other available data.
- Visit the site, collect measurements of existing meter installations, and prepare sketch of existing meters, piping and supports.
- Review the existing installations and determine if the existing meters have been installed in accordance with the manufacturer's recommended installation requirements and other recommendations such as the USEPA and the Hydraulic Institute.
- If available, review calibration data collected by the City and contact the meter manufacturers to obtain service history.
- Coordinate with the meter manufacturers' representatives to obtain costs for repairing or replacing the flowmeter.
- Prepare a cost estimate of the magnetic flowmeter improvements.
- Prepare a draft Technical Memorandum with conclusions and recommendations regarding the Parshall Flume and magnetic flowmeters and submit to City for review.
- Meet with the City to review the draft Technical Memorandum
- Incorporate City comments into a final Technical Memorandum.

Task 2.2 – Wet Well Baffle Evaluation

Consultant will provide a written evaluation of the history of the baffle that was shown on the existing Record Drawings, as well as an evaluation as to whether this baffle should be replaced. The evaluation will include:

- Contact the manufacturer of the self-cleaning wet well pumping system (Hydrostal) to determine whether the baffle is a functional, integral part of the wet well design.
- Review standards of the Hydraulic Institute regarding the use of baffles in wet wells.
- Perform internet literature search regarding use of baffles specific to the current East WRF application.
- Prepare and submit a draft Technical Memorandum presenting results of research into the use of baffles in wet wells, including purpose, location, type, manufacturer's recommendations (if any), and other results. Include recommendations for baffle in the East WRF Influent Pump Station application.
- Meet with the City to review the draft Technical Memorandum.
- Incorporate City comments into a final Technical Memorandum.

Task 2.3 – Subsurface Utility Engineering Investigations and Report

Under a subcontract, Consultant will conduct subsurface investigations, not to exceed five days effort, to locate the existing effluent line from the Northeast WRF, including:

- Provide minor traffic control within the work areas while designating and locating the subsurface utilities in accordance with applicable standards. Provide safety devices,

signs and/or other safety equipment as appropriate for work outside of the travel lanes.

- All work will take place outside the SR 60/Gulf to Bay Blvd R/W.
- ASCE Quality Level "B" Designation - Utilizing conventional electronic designating equipment together with Ground Penetrating Radar (GPR), designate and mark with paint and/or flags the horizontal location of found underground utilities. Pipelines smaller than 2" will be marked if found, but due to their small size are often invisible to current designating equipment and may not be picked up.
- ASCE Quality Level "A" Location - Provide a test hole (VVH – verified vertical and horizontal) on each found utility line. No test holes to be provided in roadway.
- For each test hole, neatly cut and remove existing pavement or other surface material (approximately 225 square inches per cut). Excavate the material through the cut, down to the utility in a way that prevents damage to wrappings, coatings or other protective coverings of the utilities (i.e. vacuum/pressure excavations, hand digging, etc). Backfill and compact with select material around the utility. Provide for restoration of the surface pavement, within the limits of the cut, at the time of the backfill.
- Mark findings in field and provide a copy of field notes (electronically).
- Survey marked utilities and submit to City (two hard copies, digital pdf, AutoCAD).

Task 2.4 - Geotechnical Data Collection and Report

Through a subcontract, Consultant will have a boring drilled in the vicinity of the proposed sewer bypass structure, including:

- Drill boring to 20 feet below land surface;
- Perform standard lab classification tests; and,
- Prepare and submit report of recommendations for structure foundation and construction.

III. FINAL DESIGN PHASE

Task 3.1 – Influent Flowmeter Repairs/Replacement

If elected to be performed by the City, Consultant will provide design of repairs or replacement of the existing influent flowmeter, including:

- Incorporate sketch of repaired/replaced meter and piping modifications into contract drawings.
- Prepare technical specification for repair/replacement of influent flowmeter, including electrical, instrumentation and controls.
- Update cost estimate.

Task 3.2 – Wet Well Baffle Replacement

If elected to be performed by the City, Consultant will provide design of a replacement wet well baffle, including:

- Design baffle hydraulics, construction, materials of construction, supports.
- Prepare drawings and details of baffle into the contract drawings.
- Prepare technical specification for baffle.
- Update cost estimate.

Task 3.3 – Wet Well Ventilation Improvements

Consultant will provide the design of a new wet well fresh air inlet. This work will include:

- Correspond with the manufacturer of the odor scrubber to identify air flow rates.
- Size fiberglass reinforced plastic (FRP) air inlet and air piping, considering the installation of single outside air inlet and multiple outlets into the wet well for even air flow distribution.
- Design stainless steel pipe supports and provide for removal of existing air inlet.
- Prepare drawings, specs and cost estimate.

Task 3.4 - Gantry Crane

Consultant will provide a design of a gantry crane to allow the existing screens to be lifted out of the influent channel. This work will include:

- Review existing drawings of the headworks provided by the City.
- Collect and review information on the existing screens including dimensions, operating clearances, weights and other pertinent dimensional information.
- Review information and correspondence previously obtained by the City from the crane manufacturer.
- Visit the site to identify clearance issues and need to relocate existing equipment including existing electrical panels.
- Prepare drawings, technical specifications and cost estimate for crane installation.

Task 3.5 – FOG Breakup Spray Water System

Consultant will provide design of a spray water system to break-up FOG accumulating in the IPS wet well, including:

- Meet with City staff to collect input on preferences for the spray water system.
- Coordinate with spray nozzle manufacturers regarding design of the system including volume and pressure requirements based on elevations and wet well dimensions.
- Prepare and submit a sketch of the proposed piping and spray water nozzle configuration for the City's review.

- Upon City approval of the sketch, perform hydraulic analysis and size piping. It is assumed that pumps will not be required.
- Prepare mechanical drawings, equipment specifications and update costs estimate.

Task 3.6 – Miscellaneous Improvements

Consultant will develop biddable drawings, specifications and cost estimates for the following proposed facilities at the East WRF:

- Provide a specification for an alternative concrete coating system for corrosion protection for the repair of the IPS and for the proposed sewer structure.
- Replace the existing IPS check valves (#1 & #2) and isolation valves.
- Provide safety nets in IPS.
- Provide chains on IPS pumps.
- Provide hose bib at IPS.

Task 3.7 –Review Submittals and Meetings

Consultant will provide hard copies and digital pdf copies of the drawings, specifications and cost estimates for review by the City including.

- 60% submittal and review meeting
- 90% submittal and review meeting

Task 3.8 – Other Considerations

The following will be incorporated into the Consultant's compensation for the project:

- Update cover drawing and standard specifications to reflect new City standards.
- Update the Engineer's Estimate of Probable Construction Costs to reflect current market conditions.
- Attend three project re-boot meetings.
- The addition of $7,844 to make up for $7,844 of work not yet completed under the closed East Filter Improvements Purchase Order.
- The addition of $2,844 to make up for payments inadvertently not made to the Consultant by the City.

IV. BID DOCUMENTS AND BIDDING PHASE

Task 4.1 – Final Bid Documents and Bidding Assistance

Consultant will provide the following additional services commensurate with the increase in construction scope:

- Address City comments from the 90% review meeting and update the bid documents including plans, specs and cost estimates.
- Update contract time, contractor work restrictions (sequence of construction) and bid form.
- Submit final bid documents for advertisement for bids.
- Prepare addenda for distribution by the City.
- Attend the pre-bid meeting with the City.
- Respond to questions as required to interpret, clarify or expand the bidding documents.
- Review and evaluate the apparent low bidder's qualifications for undertaking the work and make recommendations for contract award.
- Prepare and provide conformed Contract Documents (engineering drawings in AutoCAD and PDF format and specifications in MS Word and PDF format) to the City.

3. PROJECT GOALS:

Project deliverables will include the following:

1. Health and Safety Plan
2. Draft and final technical memorandums on flowmeters and wet well baffle: digital pdf.
3. SUE survey of NE WRF effluent pipe: five (5) hard copies, digital pdf, AutoCAD.
4. Geotechnical Report: five (5) hardcopies, digital pdf.
5. 60%, 90%, Final Drawings, Conformed Drawings and Specification and Cost Estimates: five (5) hardcopies, digital pdf, AutoCAD (as appropriate).

4. BUDGET:

See Attachment "B".

This price includes all labor and expenses anticipated to be incurred by King Engineering for the completion of these tasks in accordance with Professional Services Method "A" Cost times Multiplier Basis for all tasks, **for a fee not to exceed One Hundred Ten Thousand One Hundred Thirty dollars ($110,130).**

5. SCHEDULE:

The project is to be completed **270 calendar days** from issuance of notice-to-proceed, excluding time for City reviews. The project deliverables are to be phased as follows:

Design Phase	60 calendar days
60% Design Submittal	120 calendar days*
90% Design Submittal	60 calendar days*
100% Design Submittal	30 calendar days*

*Days following receipt of comments from City on previous phase.

6. STAFF ASSIGNMENT:

Consultant's Staff:

Principal:	Christopher F. Kuzler, P.E.
Project Manager:	Thomas A. Traina, P.E.
Project Engineers:	Jeff Elick, P.E., Lizeth Mora, E.I., Matthew Davis, P.E.
Designers:	Mark Gladbach, Frank Paul, Vartkes Toma
Clerical:	Paula Eldon

City's Staff:

Jeff Walker, PE	Project Manager
Jeremy J. Brown, PE	Utilities Engineering Manager
Richard G. Gardner, PE	Public Utilities Assistant Director
Jason Jennings	Wastewater Environmental Tech. Mgr.
Michael Gilliam	Infrastructure Maintenance Manager
Jack Sadowski	Site Representative/PUD Liaison, East WRF Chief Operator
Kervin St.Aimie	Maintenance Coordinator

7. CORRESPONDENCE/REPORTING/COMMUNICATION PROCEDURES:

ENGINEER's project correspondence shall be directed to Thomas A. Traina, P.E.

All City project correspondence shall be directed to the Project Manager, with copies to the Utilities Engineering Manager and Public Utilities Assistant Director.

ENGINEER shall provide a minimum of forty-eight (48) hours' notice prior to conducting fieldwork/site visits. ENGINEER shall provide a minimum of seven (7) days notification for site visits requiring the assistance of City Operations and Maintenance personnel.

ENGINEER acknowledges that all City directives shall be provided by the City Project Manager.

In addition to the original copies delivered as stated in the scope of work, all project deliverables will be submitted in electronic format on CD or other City approved device prior to approval of final invoice.

8. INVOICING/FUNDING PROCEDURES:

Invoices for work performed shall be submitted monthly to the:

City of Clearwater
Engineering Department
Attention: Veronica Josef, Senior Staff Assistant
PO Box 4748
Clearwater, Florida 33758-4748

Contingency services will be billed as incurred only after written authorization provided by the City to proceed with those services.

City Invoicing Code: 3277327-561300-96664

9. INVOICING PROCEEDURES

At a minimum, in addition to the invoice amount(s), the following information shall be provided on all invoices submitted on the Work Order:

A. City Project Number, Purchase Order Number and Contract Amount.
B. The time period (begin and end date) covered by the invoice.
C. A short narrative summary of activities completed in the time period.
D. Contract billing method – Lump Sum or Cost Times Multiplier.
E. If Lump Sum, the percent completion, amount due, previous amount earned and total earned to date for all tasks (direct costs, if any, shall be included in lump sum amount).
F. If Cost Times Multiplier, hours, hourly rates, names of individuals being billed, amount due, previous amount earned, total earned to date for each task and other direct costs (receipts will be required for any single item with a cost of $50 or greater or cumulative monthly expenses greater than $100).
G. If the Work Order is funded by multiple funding codes, an itemization of tasks and invoice amounts by funding code.

10. SPECIAL CONSIDERATIONS:

The consultant named above is required to comply with Section 119.0701, Florida Statutes (2013) where applicable.

The following assumptions and clarifications were made in the development of this Work Order. Should the final scope of work differ from that provided and these assumptions and clarifications, additional compensation will be required.

- The influent magmeter will be repaired/replaced in its existing location, i.e., not relocated, and no bypass is to be provided.
- No instrumentation or electrical work is associated with this SWO. Power and control wiring for the new magnetic flowmeter will be connected to the existing circuit breaker and I/O card for the existing flowmeter.
- SUE work is limited to 5 days investigative field effort.
- A single review meeting will be held with the City for Task II work efforts.

PREPARED BY:

_____
Christopher F. Kuzler, P.E.
Managing Principal
King Engineering Associates, Inc.

APPROVED BY:

_____
D. Scott Rice, PE
City Engineer
City of Clearwater

_____ _____

Date **Date**

CITY OF CLEARWATER
ENGINEERING DEPARTMENT

WORK ORDER INITIATION FORM
CITY DELIVERABLES

1. FORMAT

The design plans shall be compiled utilizing the following methods:

1. City of Clearwater CAD standards.
2. Datum: Horizontal and Vertical datum shall be referenced to North American Vertical Datum of 1988 (vertical) and North American Datum of 1983/90 (horizontal). The unit of measurement shall be the United States Foot. Any deviation from this datum will not be accepted unless reviewed by City of Clearwater Engineering/Geographic Technology Division.

2. DELIVERABLES

The design plans shall be produced on bond material, 24" x 36" at a scale of 1" = 20’ unless approved otherwise. Upon completion the consultant shall deliver all drawing files in digital format with all project data in Autodesk Civil 3D file format. If not available Land Desktop files are still acceptable, however the City or Clearwater is currently phasing out Land Desktop.

NOTE: If approved deviation from Clearwater CAD standards are used the Consultant shall include all necessary information to aid in manipulating the drawings including either PCP, CTB file or pen schedule for plotting. The drawing file shall include only authorized fonts, shapes, line types or other attributes contained in the standard release of Autodesk, Inc. software. All block references and references contained within the drawing file shall be included. Please address any questions regarding format to Mr. Tom Mahony, at (727) 562 4762 or email address Tom.Mahony@myClearwater.com.

All electronic files (CAD and Specification files) must be delivered upon completion of project or with 100% plan submittal to City of Clearwater.

East Water Reclamation Facility Influent Pump Station Rehabilitation
King Engineering Associates, Inc.

SUPPLEMENTAL WORK ORDER No. 2 INITIATION FORM
PROJECT BUDGET

Task	Description	Subconsultant	Labor	Total
1.0	**Pre-Design Phase**			
1.1	Project Coordination		$16,852	$16,852
	Subtotal		**$16,852**	**$16,852**
2.0	**Design Phase**			
2.1	Influent Flowmeter Evaluation		$10,256	$10,256
2.2	Wet Well Baffle Evaluation		$4,078	$4,078
2.3	SUE Investigations & Report	$10,850	$2,188	$13,038
2.4	Geotechnical Data Collection	$2,500	$814	$3,314
	Subtotal	**$13,350**	**$17,336**	**$30,686**
3.0	**Final Design Phase**			
3.1	Influent Flowmeter Design		$2,765	$2,765
3.2	Wet Well Baffle Replacement		$3,959	$3,959
3.3	Wet Well Ventilation Improvements		$4,031	$4,031
3.4	Gantry Crane Design	$1,500	$6,416	$7,916
3.5	Grease Spray Water System Design		$8,232	$8,232
3.6	Miscellaneous Improvements	$1,000	$3,707	$4,707
3.7	Review Submittals	$500	$5,682	$6,182
3.8	Other Considerations		$16,351	$16,351
	Subtotal	**$3,000**	**$51,143**	**$54,143**
4.0	**Bid Docs and Bidding Assistance**			
4.1	Final Bid Docs and Bidding Assistance	$350	$6,699	$7,049
	Subtotal	**$350**	**$6,699**	**$7,049**
Subtotal		**$16,700**	**$92,030**	**$108,730**
Direct Expenses				**$1,400**
Grand Total				**$110,130**