

**Work Authorization No. 1
TO THE GENERAL PROFESSIONAL ENGINEERING SERVICES
AGREEMENT BETWEEN
CITY OF COCONUT CREEK
AND
REISS ENGINEERING, INC.**

**Coconut Creek Utility Services
Distribution Wide Water Quality Optimization**

THIS WORK AUTHORIZATION is made and entered into by and between the City of Coconut Creek, Florida, hereinafter referred to as "City" and, Reiss Engineering, Inc., hereinafter referred to as "Consultant", on this day of , 2017, and is consistent with the terms of the General Professional Engineering Services Agreement (RFQ 11-19-14-10) "Master Agreement" between the City and Consultant, dated January 22, 2015;

WHEREAS, the Master Agreement provides that requirements for professional services are to be set forth in work authorizations; and

WHEREAS, the parties desire to optimize distribution system disinfectant residuals; and

WHEREAS, City has requested Consultant to investigate optimizing chloramine residuals in the City's water distribution system.

NOW THEREFORE, IT IS AGREED as follows:

Section A. BACKGROUND AND INTENT

The City of Coconut Creek (City) receives potable water to supply the City's water distribution system through three (3) bulk water supply meters connected to Broward County's distribution system. The City boosts the disinfectant (chloramines) as necessary. Evaluation by the City of recent water quality analyses, historical chemical usage, hydrant flushing schedules, and field staff's reporting has revealed opportunities to optimize water quality in the City's distribution system and has motivated the City's Utilities Department to further investigate these opportunities. Of particular interest is optimizing distribution system disinfectant (chloramines) residuals.

The City has requested Reiss Engineering, Inc. (Consultant) to investigate optimizing chloramine residuals in the distribution system, develop alternatives for reducing the losses, and provide recommendations. This investigation will include updating the City's hydraulic model to simulate chloramine residual, developing a list of water quality parameters for the City to sample at the source water (Broward County) and other remote locations, reviewing the source water sampling results, and utilizing the updated hydraulic/water quality model to simulate chloramine decay in the distribution system. The

investigation will also include reviewing the operation of the re-pump stations including the chlorine and ammonia feed systems, manipulation of isolation valves, identifying flushing locations/flows, adding disinfectant booster stations as necessary, and reviewing distribution system operations such as tank filling and drawing and chlorine burn schedules.

Section B. PROJECT REPRESENTATIVES

For City: Jean Dupuis
Assistant Director of Utilities
954-973-6786

For Consultant: Edward H. Talton, P.E.
407-679-5358
ehtalton@reisseng.com

- Flushing**
- Water Quality Modeling**
- Pipe Cleaning**
- Operational Changes**
- Demand Increases**
- Pipe Looping/Configuration**
- Pipe Size Minimization**
- Remote Treatment**

Section C. SCOPE OF WORK

The Consultant proposes the following scope to accomplish the above objectives:

Task 1.0 – Project Administration

Task 1.1: Kick-Off Meeting/Site Visit/Data Collection – Prepare for and attend a project kick-off meeting with all associated Team members, including the City’s representatives, to discuss the project goals and objectives, clarify team roles and assignments, as well as establish the project schedule and deliverables. The Consultant will prepare and submit a meeting summary.

Consultant will also perform the following during the Kick-Off Meeting visit:

1. Visit the re-pump stations to document the current operations including the chlorine and ammonia feed systems.
2. Obtain data needed for Task 2 and Task 3 including pressure, flow, and system water quality data.
3. Confirm the City’s established fire flow rates and durations.

Task 1.2: Progress Conference Call – Prepare for and conduct one (1) progress conference call with the City to review progress of the project and project schedule. The Consultant will prepare and submit a meeting summary for the progress conference call.

Task 1.3: General Project Administration – Perform general project coordination and management activities including general administrative activities for this authorization, as well as specific coordination activities with the team members including the City's staff and other representatives.

Consultant will also perform the following within this Task:

1. Prepare and submit invoices for this assignment to the City. The invoice will include percent complete for each task to advise and highlight the overall progress of the water quality evaluation services, as well as identify items completed and on-going/pending activities.

Deliverables:

- Meeting Summaries
- Monthly Project Progress Reports and Invoices

Task 2.0 –Water Quality Model Verification

The goal of this Task is to determine Broward County supply water quality characteristics at the connection points to the City for input into the City's hydraulic model. The focus will be starting monochloramine residual concentrations and decay rates observed at the City's connection to the County but include a review of other water quality parameters as well to evaluate the supply quality.

Task 2.1 – Supply Water Inputs Determination and Quality Analysis – For this Task, Consultant will:

1. Review 2 years of County connection points' available historical water quality sampling results from the Broward County source water. Data could include total chlorine, monochloramine, free ammonia, pH, alkalinity, calcium hardness, nitrate, nitrite, color and other available parameters.
2. Summarize the available connection point water quality data in tables and/or figures.
3. Develop a list of supply connection water quality parameters for the City to sample water being received from the three Broward County connection points. Parameters will include a bulk decay test. City will collect samples and self-perform or coordinate/pay for laboratory/field analyses, including two bulk decay tests at each connection point over a 2-week period.
4. Process the City-collected data and summarize into inputs for the hydraulic model, including chloramine residual connection point input patterns, calculating bulk chloramine decay coefficients.

5. Analyze the summarized supply water quality data on a desktop level for appropriateness as a water supply.
6. Input the supply water quality coefficients and initial connection point values into the hydraulic model.
7. Prepare a technical report subsection on the supply water quality model including conclusions and recommendations for future connection point monitoring.

Task 2.2: Distribution Inputs Determination – For this Task, Consultant will:

1. Review past and present distribution system operations as it relates to the hydraulic model and adjust the hydraulic model to match current operations.
2. Review 2 years of available City's distribution system historical water quality sampling results from the City. Data could include total chlorine, monochloramine, free ammonia, pH, alkalinity, calcium hardness, nitrate, nitrite, color and other available parameters as available.
3. Develop a list of distribution system water quality parameters for the City to sample. Parameters will include one bulk decay test at each storage tank. City will collect samples and self-perform or coordinate/pay for laboratory/field analyses, including one bulk decay test at each storage tank over a 2-week period.
4. Process the City-collected data and summarize into inputs for the hydraulic model, including estimating pipe wall chloramine decay coefficients.
5. Perform a source trace and assign/adjust bulk decay coefficients based on the various zones of influence for each of the 3 connection points.

Task 2.3: Water Quality Model Verification – For this Task, Consultant will:

1. Enable the City's hydraulic model to perform water quality modeling (chloramine residual) and create specific scenario for existing conditions.
2. Summarize the water quality model output and compare the collected distribution and supply connection data.
3. Make adjustments to the water quality model to best match field conditions. Adjustments could include bulk decay and pipe wall decay coefficients as well as other model inputs.
4. Prepare graphs, tables and figures to present the final model-to-field comparison results.
5. Areas of significant, unresolved model-to-field disagreement will be identified to the City for additional field investigations by the City. Such disagreements could include unintentionally closed valves, pipe mapping discrepancies, faulty measuring devices, etc. Additional City field investigations could include checking for closed valves, verifying mapping with as-built records, calibration instrument checks, etc.
6. Prepare a technical report subsection on the water quality model verification including conclusions and applicability of the model to proceed with water quality optimizations.

Data Required: Existing hydraulic model, existing operational protocols, existing auto flusher locations and flows, chloramine residual and other water quality data (2 years) for the 3 supply connections and the distribution system, historical chlorine burn dates over the last 2 years, execution of the 2-week field sampling plan.

Deliverables:

- Draft and final technical report sections for supply water quality and water quality model verification.

Task 3.0 – Distribution System Water Quality Optimization

The goal of this task is to develop and test viable options for improving distribution system water quality (including chloramine residuals) with assistance from the water quality model.

Task 3.1: Distribution System Water Quality Optimization – Consultant will:

1. Develop and model water age and chloramine decay for an optimized auto-flushing alternative for existing conditions assuming status quo supply quality and tank operations.
2. Develop and model water age for up to three alternatives to hydraulically operate the storage tanks to improve water quality.
3. Using the best or most appropriate storage tank hydraulic operation, optimize chemical addition at the storage tanks and model the resulting chloramine decay.
4. Develop and model chloramine decay for up to 3 source treatment options.
5. Develop up to three other options that could include piping improvements, hydraulic boosting, chloramine boosting and other options that could improve distribution chloramine residuals.
6. Hold a workshop with the City to discuss alternatives and select up to two options for final adjustment.
7. Develop and model chloramine decay for an optimized auto-flushing alternative for the two selected options.
8. Develop cost estimates for the two options.
9. Prepare a technical report subsection on the Distribution System Water Quality Optimization including conclusions and recommendations.
10. Compile the report subsections in this scope into a final report.

Deliverables:

- Report subsection on the Distribution System Water Quality Optimization (Draft and Final)
- Combined Distribution Water Quality Modeling Report

Section D. COORDINATION

The Consultant will coordinate the project with the City staff members listed below as appropriate.

Function	Name	Email	Phone
Asst. Director	Jean Dupuis, P.E.	JDupuis@coconutcreek.net	954-673-9786
Engineering	Interim Utilities Engineer	RBlanchette@coconutcreek.net	954-673-9786

Section E. SCHEDULE

Work will commence upon receipt of the City’s notice-to-proceed (NTP) and follow the milestone dates below:

Milestone	Calendar Days to Complete	Sum of Days from NTP
TASK 1 – PROJECT ADMINISTRATION	On-going	On-going
TASK 2 – WATER QUALITY MODEL INPUTS DETERMINATION AND VERIFICATION	90	90
TASK 3 – DISTRIBUTION SYSTEM WATER QUALITY OPTIMIZATION	70	160

NTP = Notice to Proceed

Schedule anticipates a five (5) working day review period by the City for draft documents.

Section F. BASIS OF COMPENSATION

For the professional services set forth in this Scope document, the City shall compensate Consultant a fixed fee for Tasks 1 through 3 on a percent completed basis as shown below:

Task	Cost
TASK 1 – PROJECT ADMINISTRATION	\$6,975.00
TASK 2 – WATER QUALITY MODEL INPUTS DETERMINATION AND VERIFICATION	\$34,770.00
TASK 3 – DISTRIBUTION SYSTEM WATER QUALITY OPTIMIZATION	\$42,705.00
Total Fixed Fee Cost	\$84,450.00

A breakdown of the tasks by personnel, hours, and hourly rates for Consultant personnel is attached.

Section G. CITY'S RESPONSIBILITY

The following shall be provided by the City in order to assist in the completion of the Consultant's tasks:

- a) Copies of available record drawings.
- b) Copies of available operating reports and maintenance records.
- c) Copies of available operation and sampling data relating to water quality.
- d) Copies of available operation and sampling procedures.
- e) Performing field sampling and field/laboratory analyses for 2-week water quality verification field data collection period
- f) Additional City field investigations related to field-to-model disagreements such as checking for closed valves, verifying mapping with as-built records, calibration instrument checks, etc.

Section H. SERVICES NOT INCLUDED

The following are examples of some specific additional services that may be required, but are not included within this Scope of Services.

- Lab fees
- Support for implementation of alternatives identified in the study
- DPB investigations
- Regulatory reviews
- Lead and Copper sampling and reporting analysis

These and other services can be provided, if desired by Coconut Creek, under a separate Scope of Service(s) or by an amendment to this Scope. Services performed will be on an as-directed basis in accordance with a written Notice to Proceed from Coconut Creek.

IN WITNESS WHEREOF, the parties hereto have caused this Work Authorization
No. 1 to be executed on the _____ day of _____, 2017.

ATTEST:

CITY OF COCONUT CREEK, FLORIDA
a Florida municipal Corporation

Leslie Wallace May, City Clerk

By: _____
Mary C. Blasi, City Manager

Approved to Legal Form:

Terrill C. Pyburn, City Attorney

CONSULTANT

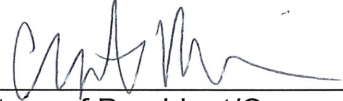
REISS ENGINEERING, INC.

ATTEST:



(Corporate Secretary)

Christophe Robert
Type/Print Name of Corporate Secy.

By: 
Signature of President/Owner

PRESIDENT
Type Print Name of President/Owner