

Meeting Date
October 7, 2014



AGENDA	
Section	CONSENT
Item No.	II.A.10

AGENDA REPORT
BREVARD COUNTY BOARD OF COUNTY COMMISSIONERS

SUBJECT:	APPROVAL OF TASK ORDER NO. 9 WITH REISS ENGINEERING, MIMS WATER DISTRIBUTION SYSTEM IMPROVEMENTS EVALUATION (DISTRICT 1) (Fiscal Impact: \$115,000.00)
DEPT/OFFICE:	UTILITY SERVICES DEPARTMENT

Requested Action:

It is requested that the Board of County Commissioners execute Task Order No. 9 with Reiss Engineering, Inc. in the amount of \$115,000.00 for Water Distribution System Improvements Evaluation of the Mims Water Treatment Plant (WTP) and approve all associated budget changes.

Summary Explanation & Background:

The County owns and operates the Mims Water Treatment Plant (WTP), and associated distribution system facilities, which serves approximately 7,300 customers and is located in the northern area of Brevard County, Florida.

The County has identified a need to develop a hydraulic model for the Mims potable water system through computer-simulation scenarios, within the Mims potable water distribution system, to establish baseline operating conditions and evaluate operational adjustments, and develop capital improvement projects to improve distribution system performance. Most modern utilities have a hydraulic model in place. The Mims water plant distribution system has never been modeled before.

This scope has been developed by the Consultant to assist the County in creating and calibrating a potable water hydraulic model (Model). The Model will be developed through field work prior to the initial set-up and will be followed by extensive testing to prove the Model's accuracy. The Model will be a valuable tool, allowing the County to evaluate the existing capabilities of the Mims potable water distribution system, and identify modifications required to improve water age, pressure, velocity, as well as maintain fire protection within the service area. The ability to theoretically test improvements limits the risk of full-scale trial and error which risks adversely affecting customer quality and level of service. The Model will also protect the County's investment in plant improvements.


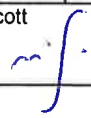
This project was identified in the county-wide utility asset evaluation in 2013.

Fiscal Impact: \$115,000.00 - Funds are budgeted in 4153/365330/5468100.

Contact: Robert G. Adolphe, P.E., Director, 321-633-2091, bob.adolphe@brevardcounty.us

Clerk to the Board instruction: Return two original task orders, executed by Chairman, to Utility Services, MS#81

Exhibits Attached: Three Original Task Orders

Contract /Agreement (If attached): Reviewed by County Attorney		Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	PR <input type="checkbox"/>	USD FINANCE <input checked="" type="checkbox"/>
County Manager		Assistant County Manager, Mel Scott			Department Director / Extension		
Stockton Whitten					Robert G. Adolphe, P.E./ x52091		



Tammy Etheridge, Clerk to the Board, 400 South Street • P.O. Box 999, Titusville, Florida 32781-0999

Telephone: (321) 637-2001
Fax: (321) 264-6972

October 8, 2014

M E M O R A N D U M

TO: Robert Adolphe, Utility Services Director

RE: Item II.A.10., Task Order No. 9 with Reiss Engineering, Inc. for Mims Water Treatment Plant Distribution System Improvements Evaluation

The Board of County Commissioners, in regular session on October 7, 2014, executed Task Order No. 9 with Reiss Engineering, Inc., in the amount of \$115,000, for water distribution system improvements evaluation of the Mims Water Treatment Plant (WTP); and approved all associated budget changes. Enclosed are two fully-executed copies of the Task Order.

Your continued cooperation is greatly appreciated.

Sincerely yours,

BOARD OF COUNTY COMMISSIONERS
SCOTT ELLIS, CLERK

Tammy Etheridge

Tammy Etheridge, Deputy Clerk

Encls. (2)

cc: Finance
Budget

**TASK ORDER NO. 9
SCOPE OF SERVICES
Reiss Engineering, Inc.
Water Distribution System Improvements Evaluation**

THIS TASK ORDER is made and entered into by and between the Board of County Commissioners of Brevard County, Florida, hereinafter referred to as "County" and, Reiss Engineering, Inc., hereinafter referred to as "Consultant", consistent with the terms of the Master Agreement between the County and Consultant;

WHEREAS, the Master Agreement between the County and Consultant provides that requirements for professional services are to be set forth in tasks orders;

IT IS AGREED as follows:

Section A. BACKGROUND AND INTENT

The County owns and operates the Mims Water Treatment Plant (WTP), and associated distribution system facilities, which serves approximately 7,300 customers and is located in the northern area of Brevard County, Florida.

The County has identified a need to develop a hydraulic model for the Mims potable water system to computer-simulate scenarios, within the Mims potable water distribution system, to establish baseline operating conditions and evaluate operational adjustments and capital improvement projects to improve distribution system performance.

This scope has been developed by the Consultant to assist the County in creating and calibrating a potable water hydraulic model (Model). The calibrated Model will be a valuable tool, allowing the County to evaluate the existing capabilities of the Mims potable water distribution system, and identify modifications required to improve water age, pressure, velocity, as well as maintain fire protection within the service area. The ability to theoretically test improvements limits the risk of full-scale trial and error adversely affecting customer quality and level of service, as well as protecting the County's investment in these improvements.

Section B. PROJECT REPRESENTATIVES

For County:

Mark W. Reagan, JD, PE
321-633-2089
Mark.Reagan@brevardcounty.us

For Consultant:

James R. Murin, PE
407-679-5358
jrmurin@REISSENG.com

Section C. SCOPE OF WORK

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

Task 1 – Project Administration

Task 1.1: Kick-Off Meeting – Consultant will schedule, organize and attend a project "kick-off" meeting to discuss the project goals and objectives, clarify roles and assignments, as

well as review the project schedule and deliverables. Consultant will prepare and distribute meeting notes in a timely manner following the meeting.

Task 1.2: Progress Reports, Coordination and Meetings – Consultant will prepare progress reports and invoices to be submitted on a monthly basis for the duration of the project. Consultant will perform project coordination and conduct up to three (3) update meetings with the County.

Task 2 – Hydraulic Model Construction

In order to improve operations, improve energy conservation and aid planning decisions, the Consultant plans to utilize either Bentley's WateCAD or Innowyze's InfoWater software to construct the Model. The Consultant's efforts will include construction of the Model and an assessment of potable water system pipes, pump stations and other key infrastructure within the system.

Task 2.1: Data Collection and Work Plan Development – Consultant will provide a list of data required for Model construction that will include (at a minimum) the most recent data listed below (Section E.). Consultant will utilize the County's GIS piping layout for existing pipes, reviewed construction plans for planned pipes, as-builts for storage/pump stations or the best available information to construct the Model. Consultant will develop a work plan for development of the Model and conduct a Model review workshop with the County to examine the Model's pipe layout, connectivity, and infrastructure data.

Task 2.2: Hydraulic Model Construction – Consultant will incorporate infrastructure data such as pipes, tanks, pumps, valves and interconnects into the Model. The Model will consist of all potable water distribution system piping identified in the County's GIS data including piping constructed, under construction, or currently being designed in 2014 which are not included in the County's GIS data. Consultant will perform quality control activities to check Model input such as elevations and pump curves as proper Model inputs.

Task 2.3: Demand Allocation and Scenario Management – The Consultant will allocate historical potable water meter demands to Model nodes, using the County's potable water meter geo-database, to simulate typical flow and pressure throughout the distribution system. Demands will be based on the most recent year of potable water meter records. Allocation will be performed in a simple, fluid process using the demand allocator module. This process assumes the County's existing potable water meter database is geo-coded (each meter has a spatial location).

Consultant will develop Model evaluation criteria based on County and engineering industry standards for potable water distribution systems. Consultant will create four (4) steady state scenarios and one (1) extended period simulation (EPS) to represent the County's existing potable water system. Model scenarios define the set of input conditions under which Model runs are executed (average day conditions, peak hour conditions, etc.). Existing operational procedures and protocols will be determined based on County input and incorporated into the Model to represent the distributions system conditions. Mims WTP and distribution system staff will be interviewed to gather specific information used for input into the Model including pressure, level and time based controls and control points. The existing operational procedures and protocols will be incorporated into the Model via logical controls. Interconnect locations, diurnal flow and pressure patterns will be included in the Model based on historical and field collected data. The result of these efforts will be a structurally verified Model ready for output comparison to field data (calibration).

Task 3 – Potable Water Model Calibration

Calibration represents field truthing of hydraulic model output and adjustment for more accurate predictive results.

Task 3.1: Hydraulic Calibration – Consultant will develop a calibration protocol which will define calibration locations, summarize field data collection, identify labor requirements, and conduct a pre- and post-calibration meeting with the County. Pressure recording devices will be used by the County to measure and record the system pressure in the service area for a period of at least 24 hours (it is assumed that the County owns portable hydrant pressure recorders). Consultant will work with County staff to schedule field staff in advance to complete proper instrument calibration, placement and data collection. Field data from the calibration effort will be collected by the County and delivered to the Consultant. Consultant will summarize, analyze, and compare the data to the Model output. Consultant will adjust Model inputs to within established hydraulic criteria as reasonable, and document results in a calibration memorandum. A percent error will be calculated by Consultant and a plan will be established to reconcile out of range discrepancies as necessary. Field checking of valves or additional data collection (by County) will be recommended as necessary. Model data that may be adjusted by Consultant includes pipe diameter and length, ground elevation, pipe friction (Hazen Williams coefficient), pump settings, and diurnal demand patterns. Consultant will deliver a functional Model that will simulate the measured field conditions with greater than 90 percent accuracy to field data collected.

Task 4 – Distribution System Improvement Scenarios

Brevard County has identified a number of key operational and structural issues within the Mims WTP distribution system that require development of improvement plans. Once constructed and calibrated, the new hydraulic model can be used to assess many of these recent and long-term operational issues such that potential solutions can be developed and tested prior to full-scale implementation. Specific Mims system issues which will be evaluated under this scope include the following:

Task 4.1: The Elevated Tank Evaluation - Consultant will evaluate the effects of the County's elevated tank on the distribution system's existing water age and operating pressures. Operations of the elevated tank will be reviewed to determine the potential for eliminating the elevated tank from the distribution system if it is considered unnecessary.

Task 4.1.1: Desktop Storage and Pumping Analysis – Consultant will complete a desktop analysis to evaluate the permitted storage and pumping capacities of the system. Elevated tanks are sometimes used to count as high service pumps when determining a system's pumping capacity. This evaluation will ensure that the potential elimination of the County's elevated storage tank will not de-rate the Mims water system.

Task 4.1.2: Elevated Tank Fire Flow Evaluation – The Consultant will review the County's fire flow standards to ensure that elimination of the elevated tank will maintain these standards. Consultant will run a fire flow simulation and determine if the pressures and velocities in the distribution system meet requirements.

Task 4.2 – Water Distribution System - Consultant will utilize the Model to perform a water age evaluation of the existing distribution system. In addition, Consultant will review and investigate the existing distribution system capacity (pressure, velocity and headloss),

identify the need for additional upsizing of existing infrastructure, address any potential looping areas throughout the distribution system, while maintaining the County's water age, hydraulic and fire flow standards.

Task 4.3 - Small Area Study - Consultant will coordinate with County staff to ensure that the future demands developed and identified in the "Small Area Study" (March 2007) are still representative. The small area study comprises an approximate total 53.9 square miles. Consultant will evaluate the new transmission main, as well as any upsizing of existing transmission mains or operational changes required to serve the future area and maintain the distribution system's water age, operating pressures and system capacity (pipe velocities, size and headloss) with the future demand.

Task 5 - Alternative Cost Analysis

Consultant will determine the conceptual construction costs for each of the selected alternatives evaluated. The conceptual construction costs include: easement acquisition, open cut installation, engineering and contingency.

Task 5.1 Elevated Tank - The conceptual cost includes decommissioning the elevated tank, if considered feasible.

Task 5.2 Water Distribution System - The conceptual cost includes determining pipe costs associated with upsizing existing infrastructure to maintain the County's water age, hydraulic, or fire flow standards. The cost estimates for the upsizing of existing water mains will compare open cut replacement versus pipe bursting. Pipe bursting is an alternative pipe replacement method that can be more cost effective.

Task 5.3 Small Area Study - The conceptual cost includes the new transmission main required to meet the area's future demands, as well as upsizing of existing transmission mains or costs associated with operational changes required to serve the future area and maintain the County's water age, hydraulic, or fire flow standards.

Task 6.0 - Distribution System Plan

Consultant will prepare and submit to the County for review and comment a detailed memorandum summarizing the conclusions and recommendations from the evaluations performed above. Upon receipt of County comments, Consultant will revise the document to final form and resubmit to the County.

Section D. COORDINATION

The Consultant will coordinate the project with the County Staff members listed below as appropriate.

Function	Name	Email	Phone
Safety	Mike Malavolta	Mike.Malavolta@brevardcounty.us	321-633-2093
Asst. Director	Ron Voll	Ron.Voll@brevardcounty.us	321-633-2091
Operations Mgr.	Steve Harrell	stephen.harrell@brevardcounty.us	321-633-2093
Area Operations	Lou Braafladt	Louis.Braafladt@brevardcounty.us	321-455-1338
Engineering	Don Kean	don.kean@brevardcounty.us	321-633-2089

Section E. COUNTY'S RESPONSIBILITY

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

- a) Reasonable access to operations, maintenance, and engineering staff.
- b) Copies of available record drawings.
- c) Copies of available design and construction documents.
- d) Copies of available operating reports and maintenance records.
- e) Copies of available GIS potable water distribution system shapefiles.
- f) Ownership and distribution of portable hydrant pressure recorders
- g) Collection of field calibration data.
- h) Geo-locating billing data demands

Section F. CONSULTANT SERVICES SPECIFICALLY NOT INCLUDED

- a) Engineering design of potable water distribution improvements.
- b) Services related to acquisition of real property, easements, or rights-of way.
- c) Collection of field calibration data

Section G. DELIVERABLES

The following results shall be delivered by the Consultant (All deliverables shall be provided only in electronic PDF format unless otherwise noted):

Task 1 – Project Administration

- a) Monthly activity reports.
- b) Timely invoices concurrent with the work.

Task 3 – Potable Water Model Calibration

- a) Calibrated Model.
- b) Deliver an electronic version of the completed Model.

Task 6 – Distribution System Memorandum

- a) Four (4) "final" copies of the Distribution System Memorandum (including one electronic copy).

Section H. SCHEDULE

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

Milestone	Calendar Days to Complete	Sum of Days from NTP
Mobilization	14	14
Task 1.0 – Project Administration	On-going	On-going
Task 2.0 – Hydraulic Model Construction	28	42
Task 3.0 – Potable Water Model Calibration	70	112
County Review of Calibrated Model	7	119
Task 4.0 - Alternative Evaluations	70	189
- Task 4.1 – Elevated Tank		
- Task 4.2 – Water Distribution System		
- Task 4.3 – Small Area Study		
County Review of Alternative Evaluations	7	196
Task 5.0 – Alternative Cost Analysis	28	224
Task 6.0 – Distribution System Plan	14	238
County Review of System Plan	14	252
Submission of Final Deliverables	7	259

NTP = Notice to Proceed

Section I. BASIS OF COMPENSATION


The fee for the scope of work described in Section C, above, shall not exceed a total of \$115,000 and shall not exceed the amounts shown in the table below for each specific task. The County shall periodically compensate the Consultant a portion of the task fee based on mutually agreed upon percentages of completion of each task.

Task	Description	Fee
1	Task 1.0 - Project Administration	\$ 7,000
2	Task 2.0 - Hydraulic Model Construction	\$ 15,000
3	Task 3.0 - Potable Water Model Calibration	\$ 40,000
4	Task 4.0 - Alternative Evaluations	
	- Task 4.1 - Elevated Tank	\$ 13,000
	- Task 4.2 - Water Distribution System	\$ 10,000
	- Task 4.3 - Small Area Study	\$ 15,000
5	Task 5.0 - Alternative Cost Analysis	\$ 5,000
6	Task 6.0 - Distribution System Plan	\$ 10,000
--	Total	\$ 115,000

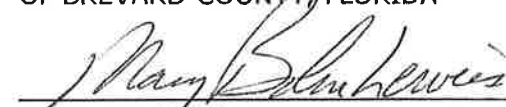
Section J. ACCEPTANCE

IN WITNESS WHEREOF, this 7th day of October, 2014.

ATTEST:

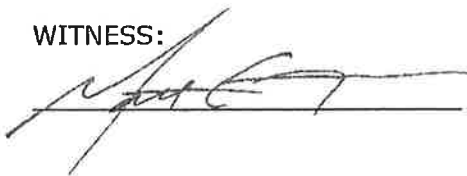

 Scott Ellis, Clerk of Courts

For: BOARD OF COUNTY COMMISSIONERS
 OF BREVARD COUNTY, FLORIDA


By: 
 Mary Bolin Lewis, Chairman

As approved by the Board on 10/7/14

WITNESS:



For: Reiss Engineering, Inc.

By: 
 James R. Murin, P.E., Vice President

11.A.15

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SCOPE OF SERVICES
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Mark W. Reagan, JD, PE
321-633-2089
Mark.Reagan@brevardcounty.us

For Consultant:

James R. Murin, PE
407-679-5358
jrmurin@REISSENG.com

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Asst. Director	Ron Voll	Ron.Voll@brevardcounty.us	321-633-2091
Operations Mgr.	Steve Harrell	stephen.harrell@brevardcounty.us	321-633-2093
Area Operations	Lou Braafladt	Louis.Braafladt@brevardcounty.us	321-455-1338
Engineering	Don Kean	don.kean@brevardcounty.us	321-633-2089

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