



City Council Agenda Item
Meeting of April 5, 2016

TO: The Honorable Mayor and Members of the City Council
FROM: James R. O'Connor, City Manager
DATE: March 29, 2016

SUBJECT: Reiss Engineering, Inc., Work Order No. 1615-C-2 Change Order Reverse Osmosis Water Treatment Facility Expansion (ROWTF)

REQUESTED BY: City Manager/Water and Sewer Director

The following is requested as it relates to the above-referenced agenda item:

- Request Council review and approval based on the attached supporting documentation.
 - No action required. (Information only)
-



DEPARTMENTAL CORRESPONDENCE
WATER AND SEWER DEPARTMENT

To: James R. O'Connor, City Manager
Dept: City Manager

Via: John O'Brien, Manager of Purchasing and Warehouse Operations
Dept.: Purchasing 403 3.29.16

From: Robert J. Bolton, P.E., Director *RJB*

Date: March 28, 2016

RE: *Reiss Engineering, Inc., Work Order No. 1615-C-2 Change Order*
Reverse Osmosis Water Treatment Facility Expansion (ROWTF)

Recommendation:

- Place this item on the City Council's Agenda for April 5, 2016;
- Approve the change in Scope of Services for an additional \$125,275.00.

Funding:

Funding is available via account number 423.9002.536.631402.

Background:

The original scope of services included efforts necessary to design, permit, and bid the expansion of the ROWTF. The scope also included limited construction management services during construction. The intent of the original scope was to see the project through the bid process and then evaluate the construction services section after a contractor was selected. This process is now complete and the scope of services for construction activities has been better defined. The net increase in services is \$125,275 which includes \$107,775 for additional construction services and \$17,500 for additional design services that were not part of the original scope.

Analysis:

Strengths: The expansion of the ROWTF will result in annual cost savings and better water quality for customers.

Weaknesses: If the ROWTF is not expanded, the City may experience degradation in water quality as the existing surficial water supply wells deteriorate.

Opportunities: There is an opportunity to utilize annual savings through process changes to fund the capital investment needed to expand the ROWTF.

RE: **Reiss Engineering, Inc.**
Work Order No. 1615-C-2 - ROWTF
Change Order

March 28, 2016
Page 2

Threats: As changes in disinfectant by-product rules take effect, the City may exceed certain levels and will be forced to report such violations. The expansion of the ROWTF will eliminate this threat.

RJB/srp
Attachment

xc: Cindy Lawson, Finance Director

SCOPE OF SERVICES AMENDMENT

CITY OF VERO BEACH RO WTF EXPANSION

Reiss Engineering, Inc.
~~July 15, 2014~~ February 23, 2016

SECTION 1 – INTRODUCTION

The City of Vero Beach (CITY) currently owns and operates a 3.3 MGD Reverse Osmosis Water Treatment Facility (ROWTF) and is planning to increase the ROWTF capacity. The current RO skid is rated at 2.0 MGD and the City is planning on expanding the capacity of the ROWTF to 4.5 MGD in order to improve the finished water quality and decrease the operation of the Lime Softening Plant (LSP).

As part of scope of services, Reiss Engineering, Inc. (REI) will provide complete design and specification preparation at the typical 60%, 90% and 100% completion levels. In general, this scope of services includes efforts necessary to design, permit, and bid the expansion of the ROWTF. In addition, engineering services as well as limited construction management services will be provided during construction. The major design elements included in the ROWTF expansion project include the following:

- ◆ ***RO Skid Modifications:*** The improvement to the existing RO skid includes modifications to the permeate header, addition of valves and flow meter in order to balance and control the flows between stage 1 and stage 2. Work will also include piping associated with the use of currently unused five pressure vessels.
- ◆ ***RO Skid Addition:*** Two 1.25 MGD membrane skids will be added to the existing treatment system. Work will include all piping, electrical components, and instrumentation components associated with the treatment unit. The center-feed design will be evaluated to assess whether the capital investment in additional piping (necessary for center feed) can offset the power cost due to potential feed pressure reduction.
- ◆ ***High Pressure Pumps:*** One of the two existing 250 HP high pressure pumps will be evaluated in terms of efficiency and, if deemed necessary, will be upgraded. The other 250 HP high pressure pumps will also be evaluated to determine whether it can be used for one of the 1.25 MGD skids. A third high pressure pump will be designed for the second 1.25 MGD skid.
- ◆ ***Chemical Feed System Upgrades and Modifications:*** The sulfuric acid and scale inhibitor feed system will be modified to accommodate the increase of chemical demands due to the addition of the two membrane skids.

- ◆ **Electrical Upgrades and Modifications:** Electrical equipment will be added to accommodate the addition of the two membrane skids.
- ◆ **Instrumentation and Control Modifications:** Additional I&C features will be included to monitor the operation of the treatment system. The instrumentation for monitoring the raw water and finished water will be replaced with new instrumentation. The existing PLC system at the facility will be replaced. Additional PLCs and/or remote I/O panels will be located at the existing membrane skid, the two new skids, the existing process area and in the electrical room.
- ◆ **Additional Design Items:** during the design of the City of Vero Beach ROWTF expansion, the following tasks that were not originally scoped were performed per the City's request:
 - REI designed the connection (including piping and valving) from the CIP system to the existing skid such as the CIP piping is permanent. Currently the City is manually installing fittings from the Clean-In-Place (CIP) piping and valves to the existing skid, which is labor intensive and inefficient, each time a CIP is performed. In order to make the CIP more automated, REI designed the connection from the CIP system to the existing skid such.
 - REI evaluated the existing biofilters treating the off-gas stream from the degasifiers to determine whether the biofilter system would need to be upgraded once the RO WTP is expanded. In addition, an O&M cost evaluation was performed in case the City decided to use the scrubbers instead of the biofilters to treat the off-gas from the degasifiers.
 - Rehabilitation of both the sulfuric acid and antiscalant chemical rooms. Work included demolition of countertops and chemical splash protection to be replaced with new chemical pumps skids. The chemical rooms will also be repainted.
 - Modification of the ammonia residual sampling system by adding a pump supplying chloraminated water from the clearwell to the ammonia analytical equipment.
 - Modification of the RO feed pump design to be able to use the existing base.
 - Two additional design progress meetings.
- ◆ **Finished Water Quality Stability Measurement System Integration.** A spreadsheet-based software will be developed and integrated into the SCADA system. The software will predict key post-treatment water quality parameters based on measured water quality and will also determine the water quality in response to potential treatment operation changes. This part of the scope will be developed and submitted for approval by the City separately from this scope of the work, when the major instrumentation and control modifications design is under way.

Anticipated permits required for this project include a construction permit (major modification to the existing WTP permit) from the Florida Department of Environmental Protection (FDEP), and a building permit from the City of Vero Beach Building Department. The FDEP permit listed

above is to be obtained as part of this work order. Building permits are anticipated to be obtained by the selected contractor.

SECTION 2 – SCOPE OF SERVICES

TASK 1 – Project Administration

1.1. Kickoff Meeting

REI will coordinate and lead a project “kick-off” meeting with the City’s staff to discuss an overview of the project and City’s goals. REI will prepare and distribute the meeting notes.

1.2. General Project Administration

REI will perform general project coordination and management activities, including administrative activities for this authorization, as well as coordination with CITY staff. REI will prepare and submit progress reports and invoices to the City for this assignment. Progress Reports will be prepared and submitted to CITY on a monthly basis to advise and highlight the overall progress of the permitting, design, and bidding tasks, as well as to identify activities which are completed, on-going, or pending.

Task 1 Deliverables:

- ◆ Coordination and lead of “Kick-Off” meeting; meeting notes.
- ◆ Monthly progress reports with monthly invoices.

TASK 2 – Design Services

2.1. Preparation of the Preliminary Design Report

REI will prepare the Preliminary Design Report (PDR) and more specifically REI will perform the following:

- a. Develop a brief description of the project and its purpose. The report will document the existing design capacity of each well, existing plant treatment facilities (RO WTF and Lime Softening Facility), existing chemical facilities and the permitted operating capacity of the plant. The existing treatment processes provided and the number and capacity of existing finished water pumps will be summarized. Existing finished water storage tank details will be set forth in the report. A site visit will be attended by the REI team members to observe existing facilities and discuss proposed improvements.
- b. REI will evaluate the configuration of the two proposed skids and determine whether the conventional configuration or the center feed configuration is the best alternative for the City.
- c. The range of chemical doses needed will be outlined for both pre-treatment chemicals used, including the sulfuric and scale inhibitor feed systems, and the average day demand for

chemical consumption will be calculated to determine the minimum storage facilities required.

- d. REI will describe the upgrades to the high pressure pumps, if necessary, which may include the replacement of the pump impellers and bowls.
- e. REI will provide a description of the proposed facility's electrical systems. Electrical work associated with the expansion, including wiring the proposed high pressure pumps to the power system will be completed by Bailey Engineering.
- f. REI will describe the operations and control strategy, as well as instrumentation and control systems, including monitoring or alarm systems; a control/SCADA schematic diagram will be provided for the proposed additions/modifications. A description of provisions for metering and sampling raw and finished water will also be provided.
- g. A conceptual engineer's opinion of cost to construct will also be developed and included in the report. The level of accuracy at this early design stage is typically between +50% and -30%.
- h. REI will prepare for and conduct a project workshop with all associated Team members, including the City's representatives to present the City with preliminary design concepts for improvements to gain City input and design preferences. In addition, REI will prepare for and conduct project meetings to discuss the City's comments on the draft PDR submittal and to present and discuss the final PDR submittal to the City.

2.2. Preparation of 60 % Design Phase Documents

REI will prepare 60% Design Phase documents for the RO WTF Expansion,

- a. Design and prepare general drawings (cover, general notes and standard details) to a 60% completion level.
- b. Design and prepare mechanical process drawings for the existing RO system and the proposed two RO skids, the proposed two high pressure pumps, and the sulfuric and scale inhibitor chemical feed systems to a 60% completion level.
- c. Prepare pre-purchase specifications for the high pressure pumps for the City's use for purchasing these long-lead items directly from one City selected sole-source manufacturer.
- d. Design and prepare electrical drawings including the site electrical plan, power and control, motor control centers, single line diagrams, panel schedules, conduit schedules, and details to a 60% completion level.

- e. Design and prepare instrumentation and control drawings for the proposed facilities, including equipment necessary to connect the local control system to the City's SCADA system, to a 60% completion level.
- f. Prepare Technical Specifications to a 60% completion level. Specifications will include a sequence of construction to maintain operation of the existing facilities.
- g. At the end of the 60% design completion level, assemble and submit contract documents to the City for review and comments.
- h. Prepare an updated construction cost estimate for the project. Estimates for all major construction quantities and vendor quotes for all equipment will be provided.
- i. Attend 60 % design phase document review meetings with the City. REI will provide meeting agendas, summaries and action items resulting from the meeting.
- j. Respond to City comments and outline revisions to be made to the documents.

2.3. Preparation of 90% Design Phase documents and 100% Construction Phase documents (For Bid)

REI will prepare 90% Design Phase documents and 100% Construction Phase documents for bid (including the construction drawings, the technical specifications and the front end sections) for the City's RO WTF.

- a. Design and prepare general drawings to a 90% completion level.
- b. Design and prepare mechanical process drawings for the existing RO system and the proposed two RO skids, the proposed two high pressure pumps, and the sulfuric and scale inhibitor chemical feed systems to a 90% completion level.
- c. Design and prepare electrical drawings including the site electrical plan, power and control, motor control centers, single line diagrams, panel schedules, conduit schedules, and details to a 90% completion level.
- d. Design and prepare instrumentation and control drawings for the proposed facilities, including equipment necessary to connect the local control system to the City's SCADA system, to a 90% completion level.
- e. Prepare a complete draft 90% set of Technical Specifications.
- f. At the end of the 90% design completion level assemble and submit contract documents to the City for review and comments.
- g. Prepare an updated construction cost estimate for the project. Estimates for major construction quantities and vendor quotes for equipment will be provided.

- h. Attend a 90% Design Phase review meeting with the City. REI will provide meeting agendas, summaries and action items resulting from the meeting.
- i. Respond to City comments and outline revisions to be made to the documents.
- j. Prepare 100% Construction Phase documents (For Bid) and deliver to the City.

Task 2 Deliverables:

- ◆ PDR Document
- ◆ (4) sets of construction document phase (90% design; QC/Owner review) documents including 24"x36" 90% design phase drawings.
- ◆ (4) sets of 100% design documents including 24"x 36" final design drawings.
- ◆ CD with final 100% design drawing files (PDF) and technical specification files (PDF).
- ◆ Construction cost estimates at 90% design.

TASK 3 – Permitting Services

3.1. FDEP Permitting

REI will prepare Design Documents developed under Task 2 for submission to FDEP. The FDEP permit fees for a major permit modification will be paid by CITY. REI will prepare a written letter response to one (1) Request for Additional Information (RAI) provided by FDEP during the permit review process.

Task 3 Deliverables:

- ◆ Submission of Design Documents to FDEP.

TASK 4 – BIDDING SERVICES

4.1. Bid Document Review, Modifications, and Preparations

REI will also prepare the Bid Form, submit a draft form to CITY for review, and prepare a final Bid Form. It is assumed that the City will prepare the General Conditions, Supplemental Conditions and Instructions to Bidders documents.

4.2. Attendance at Pre-bid Conference

REI will attend a pre-bid conference at a location selected by CITY and answer contractor questions as applicable. REI will prepare and submit meeting notes to CITY's Procurement Team for subsequent distribution to prospective bidders.

4.3. Question Response

In consultation with CITY, REI will prepare and transmit responses to contractor questions received by CITY during the pre-bid and bid processes. REI will also prepare addendums with CITY approval and submit them to the Procurement Team for distribution to bidders.

Task 4 Deliverables:

- ◆ Attendance at Pre-bid meeting.
- ◆ Bidder question responses to CITY in Microsoft Word format.
- ◆ Five (5) sets of Conformed Documents and a CD with electronic versions (AutoCAD; PDF) of the Conformed Documents.

TASK 5 – ENGINEER OF RECORD FOR SERVICES DURING CONSTRUCTION

5.1. Meeting and Project Administration

REI will coordinate and lead a pre-construction meeting with the Contractor, subcontractors, and City to discuss the contract duration, construction schedule, submittals, payment submittals, plant operation and coordination, etc. REI will also attend up to ~~nine-fourteen~~ (914) project status meetings, held monthly, during the construction period, assumed to be 914 months per the Contractor's schedule (Florida Design). REI will prepare and distribute meeting notes, as needed, for each of the meetings.

REI will perform general project coordination and management activities, including administrative activities for this authorization, as well as coordination with CITY staff and CITY representatives.

5.2. Shop Drawings and RFI

REI will review ~~all~~ the shop drawings submitted by the Construction Contractor for general compliance with the Contract Documents. REI will return them as outlined in the Contract Documents as either approved, approved as noted, revise and resubmit, or not approved. The CITY will be copied on ~~all~~ the shop drawings returned to the Construction Contractor.

REI will also respond to any requests for information (RFI) from the Construction Contractor during the construction duration. The CITY will be copied on ~~all~~ the RFI responses submitted by REI.

5.3. Periodic Site Visits and Pay Requests

In addition to the project status meetings, REI will make periodic site visits to inspect the construction and verify completion of work in compliance with the Contract Documents. The site visits, up to ~~nine-fourteen~~ (149), will coincide with the pay requests during construction.

REI will review all monthly pay requests submitted by the Construction Contractor and confirm the request quantities or percentages match the work performed. Approved pay requests will be forwarded to the CITY for payment. Any problems or issues with the pay requests will be returned to the Construction Contractor for revision.

5.4. Technical Assistance

REI will provide technical assistance to the Contractor and the City representatives during project construction to provide clarifications and interpretations of the drawings and specifications and to resolve technical issues or conflicts, which may arise. The Engineer of Record will also communicate with the RPR on a daily basis to resolve technical issues.

5.45. Start-Up

REI will attend start-up of the two new RO skids as well as start-up of the existing skid after modification. REI will also attend a final start-up of the entire plant upon final completion of the project. An estimated five (5) start-up trips (one day trip) to the site is assumed for periodic attendance during start-up.

5.56. Record Drawings

REI will prepare final record drawings based on as-built drawings provided by the Contractor, shop drawing submittals, RFI's, and REI inspections or site visits. REI will provide three (3) full size sets of the final record drawings for CITY files.

5.67. Permit Certification

REI will prepare and submit final record drawings and a permit certification application package to the FDEP as necessary to certify the construction of the project and transfer the improvements to operation. If required, REI will provide three (3) full size sets, signed and sealed, of the final record drawings for submission to FDEP under the Permit Certification package.

TASK 6 – RESIDENT PROJECT REPRESENTATIVE FOR CONSTRUCTION SERVICES

REI will provide a ~~Senior~~ Resident Project Representative (RPR) during for half the duration of the construction, i.e. four and half months (800 hours) spread over the nine fourteen months of construction (per the Contractor's schedule) to provide oversight of the project. It is anticipated that as low as one partial day a week during the first phase of the project (when there is limited construction activities) up to four-day weekly trips during RO skids and pump installation and start-up will be required.

The RPR staff will provide on-site observation services to observe that the CONTRACTOR is constructing the project in conformance to the Contract Documents. The RPR staff will maintain a daily log documenting CONTRACTOR's activities and progress on the project, verify quantities, and to review the CONTRACTOR's "As-Built" redlines. During each site visit a report of observed activities, progress, discussions, and any identified deficiencies will be developed for the project record. Pictures will be taken to support daily logs.

The RPR staff will review and log results of material testing, pressure testing, bacteriological clearances, construction video, etc. for compliance with the Contract Documents. Copies of the testing results will be forwarded to the CITY.

SECTION 3 – SCHEDULE

The actual completion dates shall be dependent on the date of Work Order notice-to-proceed (NTP) is issues and are defined as follows:

Task	Commencing	Duration (weeks)
Task 1: Project Administration	From NTP	On-going
Task 2: Design	From NTP	32
Task 3: Permitting	From NTP	32
Task 4: Bidding	From Completion of Tasks 2 and 3	12
Task 5: EOR Services during Construction	From Completion of Task 4 Notice to Proceed for CONTRACTOR	4062
Task 6: RPR Construction Services	From Completion of Task 4 Notice to Proceed for CONTRACTOR	4062

SECTION 4 – COMPENSATION

For the professional services set forth in this scope of services, the CITY shall compensate REI a lump sum fee for Tasks 1 through 6 on a percent complete basis as follows:

Task	Total Fee	Amended Fee
Task 1: Project Administration	\$10,590	\$10,590
Task 2: Design	\$157,310	\$174,810
Task 3: Permitting	\$3,620	\$3,620
Task 4: Bidding	\$15,370	\$15,370
Task 5: EOR Services during Construction	\$82,660	\$167,435
SUBTOTAL	\$269,550	\$371,825
Task 6: RPR Construction Services*	\$100,000	\$123,000
TOTAL	\$369,550	\$494,825

* Budgetary cost that may need to be adjusted once a contractor is selected

SECTION 5 – OBLIGATIONS OF THE CITY

The CITY is responsible for providing the following information to REI:

- Review of submittals in a timely manner and response to project management communications
- Provide all available data, plans, and equipment information for the CITY's existing facilities in the project area, as necessary.

For construction services, the CITY is responsible for the following:

- Management and distribution of communication documents, paperwork, shop drawings and any other documents that came to the CITY from CONTRACTOR to appropriate parties.
- Contractor's bonds and insurance management
- Legal matters and contract issues between CONTRACTOR and CITY
- Document Control
- Pay requests and change orders management
- Obtaining warranties and guarantees from CONTRACTOR and manufacturers
- Water quality testing and material testing
- Coordination of third party inspections and certifications
- Temporary piping during start-up for flushing
- On-site safety and security
- Spare-parts management

**RO WTP EXPANSION - CONSTRUCTION SERVICES
REISS ENGINEERING**

	Original	New	Additional	TOTAL	Amended
		Going from 9 to 14 months + more shop drwgs	Tech. Assist		
EOR Services	\$82,660	\$130,000	\$37,435	\$167,435	\$84,775
RPR	\$100,000	\$155,000	(\$32,000)	\$123,000	\$23,000
TOTAL	\$182,660	\$285,000	\$5,435	\$290,435	\$107,775
Additional design services and extras					\$17,500
Modified RO feed pump to use existing base Rehab of day tank rooms with paint Ammonia recirculation pump for monitoring CIP piping design to existing skid Evaluation of the biofilters Scrubber chemical cost estimates 2 additional meetings					
TOTAL ADDITIONAL FEE					\$125,275