



**PURCHASING ITEM  
FOR  
COUNCIL AGENDA  
Memo No. CP14-125**

**1. Agenda Item Number:**  
**14**  
**2. Council Meeting Date:**  
February 13, 2014

**TO: MAYOR & CITY COUNCIL**

**3. Date Prepared:** January 17, 2014

**THROUGH: CITY MANAGER**

**4. Requesting Department:** Municipal Utilities

**5. SUBJECT:** Project Agreement with Carollo Engineers, Inc., for Water and Wastewater Plant Control System Upgrades.

**6. RECOMMENDATION:** Staff recommends City Council award a Project Agreement to Carollo Engineers, Inc., for Water and Wastewater Plant Control System Upgrades, pursuant to Annual Permitting, Studies, Design, and Post-Design Services Contract, No. EN1309-101, Project No. WA1412-201, in an amount not to exceed \$183,580.

**7. BACKGROUND/DISCUSSION:** The Pecos Surface Water Treatment Plant (SWTP), located at 1475 East Pecos Road, and the Airport Water Reclamation Facility (AWRF), located at 905 East Queen Creek Road, utilize a Distributed Control System (DCS) consisting of components only manufactured and serviced by Invensys/Foxboro.

Both facilities have processes that communicate through fiber optic cables to the plants' control systems. The existing equipment used for this communication is obsolete and will no longer be supported by Invensys/Foxboro.

The project scope is to prepare electrical, instrumentation, controls construction documents, and coordination with a Construction Manager at Risk contractor to upgrade the plant control systems. Filter control panels and electrical room enclosures will also be modified to accommodate the upgrades.

**8. EVALUATION:** This project is being performed under the Annual Permitting, Studies, Design, and Post-Design Services Contract, No. EN1309-101, with Carollo Engineers, Inc. The costs proposed for this project have been evaluated by staff and are determined to be reasonable. The contract completion time is 180 calendar days following Notice to Proceed.

**9. FINANCIAL IMPLICATIONS:**

Cost: \$183,580  
Savings: N/A  
Long Term Costs: N/A  
Fund Source:

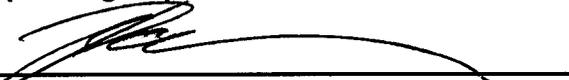
<u>Account No.:</u>	<u>Fund Name:</u>	<u>Program Name:</u>	<u>CIP Funded:</u>	<u>Amount:</u>
601.3820.6718.6WA210	Water Bond	Water Treatment Plant Improvements	Yes	\$128,506
611.3910.6817.6WW621	Wastewater Bond	Water Reclamation Facility Improvements	Yes	\$ 55,074
				<u>\$183,580</u>

**10. PROPOSED MOTION:** Move City Council award a Project Agreement to Carollo Engineers, Inc., for Water and Wastewater Plant Control System Upgrades, pursuant to Annual Permitting, Studies, Design, and Post-Design Services Contract, No. EN1309-101, Project No. WA1412-201, in an amount not to exceed \$183,580.

**ATTACHMENTS:** Project Agreement, Location Map

**APPROVALS**

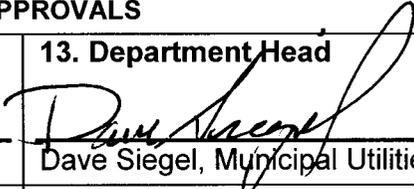
**11. Requesting Department**

  
John Knudson, Utilities Engineering Manager

**12. Transportation & Development**

  
Bob Fortier, Capital Projects Manager

**13. Department Head**

  
Dave Siegel, Municipal Utilities Director

**14. City Manager**

  
Rich Dlugas

**PROJECT AGREEMENT  
PURSUANT TO ANNUAL CONTRACT NO. EN1309-101**

**PROJECT AGREEMENT NO: WA1412-201**

This PROJECT AGREEMENT is made this \_\_\_\_ day of \_\_\_\_\_, 2014, by and between the City of Chandler, a municipal corporation (hereinafter referred to as "CITY") and Carollo Engineers, Inc. a Delaware corporation, licensed to do business in the State of Arizona (hereinafter referred to as "Annual Consultant") and is a project agreement entered into pursuant to Annual Contract No. EN1309-101.

CITY and Carollo Engineers, Inc., in consideration of the mutual covenants herein set forth, agree as follows:

**ARTICLE 1 - DESCRIPTION OF WORK:**

This project is Water and Wastewater Plan Control System Upgrades, Project Number WA1412-201. The scope of work consists of Water/Wastewater Plant Control System Upgrades, all as more particularly set forth in Exhibit A attached hereto and incorporated herein by reference.

The Annual Consultant shall not accept any change of scope, or change in contract provisions, unless issued in writing, as a contract amendment and signed by the Contract Administrator.

**ARTICLE 2 - CONTRACT PRICE:**

CITY shall pay Annual Consultant for completion of the Work in accordance with the Contract Documents a fee not to exceed One Hundred Eighty Three Thousand Five Hundred Eighty Dollars (\$183,580) determined and payable as set forth in Annual Contract EN1309-101 and Exhibit B attached hereto and made a part hereof by reference.

**ARTICLE 3 - CONTRACT TIME:**

The contract time is one hundred eighty calendar days and Annual Consultant agrees to complete all work within One Hundred Eighty (180) calendar days of the date CITY issues a Notice to Proceed.

**ARTICLE 4 - GENERAL:**

This Project Agreement is entered into pursuant to Annual Contract No. EN1309-101 and the terms and conditions contained therein are incorporated herein by reference as if set forth in full.

IN WITNESS WHEREOF, the parties hereto have executed this Project Agreement on the day and year first written above.

This Project Agreement will be effective on this \_\_\_\_\_ day of \_\_\_\_\_, 2014.

CITY OF CHANDLER

FOR THE ANNUAL:

\_\_\_\_\_  
MAYOR DATE:

By: David Oule Amelia Oule  
Title: SE. VICE PRESIDENT Executive V.P.

ADDRESS FOR NOTICE  
City of Chandler  
P.O. Box 4008, Mail Stop 407  
Chandler, AZ 85244-4008  
480-782-3307

ADDRESS FOR NOTICE  
\_\_\_\_\_  
Carollo Engineers, Inc.  
4600 E. Washington St., Ste. 500  
Phoenix, AZ 85034

APPROVED AS TO FORM:

Phone: 602-263-9500  
Fax: 602-265-1422

\_\_\_\_\_  
City Attorney By: [Signature]  
ATTEST:

\_\_\_\_\_  
City Clerk

## **EXHIBIT A SCOPE OF WORK**

### **PROJECT UNDERSTANDING**

The Pecos SWTP is located at 1475 East Pecos Road and is currently capable of providing up to 60 million gallons per day (mgd) of water treatment. The treatment processes include raw water intake, mechanical bar screening, raw water pumping, equalization facilities, ballasted flocculation treatment, deep bed filtration, disinfection, and finished water pumping.

The Airport Water Reclamation Facility is located at Queen Creek Road and McQueen Road and is currently being expanded to a capacity of 22 mgd. The liquids treatment processes consist of screening, biological nutrient removal via activated sludge, secondary clarification, tertiary filtration, and disinfection. The solids treatment processes include waste activated sludge (WAS) thickening, sludge storage, and sludge dewatering.

The process control systems at both of the facilities utilize a Distributed Control System (DCS) consisting of components manufactured by Invensys/Foxboro.

The CITY has expressed concern with regard to the aging infrastructure associated with the two DCS systems and the fact that certain components are becoming obsolete. Specifically, these components include the Invensys Foxboro Series 100 Fieldbus Modules (FBM100s).

The overall goal of the project is to provide the CITY with an upgrade from the existing FBM100s, to the newer FBM200.

### **PROJECT ASSUMPTIONS**

- 1) The detailed design services proposed as part of this scope are based upon a Construction Manager at Risk (CMAR) delivery method.
- 2) The following is a list of all the panels which will be replaced or modified at the Pecos SWTP:
  - a. Filter Control Panels Nos. 1-12 (Replaced) to match upright cabinets found at Airport WRF, with the exception that only a single filter will be on a cabinet - not 2 filters per cabinet.
  - b. Electrical Room No. 1 – I/O Enclosure (Replaced) to accommodate new FBM200s.
  - c. Electrical Room No. 2 – I/O Enclosure (Replaced) to accommodate new FBM200s.
- 3) The following is a list of all the panels which will be replaced or modified at the Airport WRF:
  - a. Filter Control Panels Nos. 1-8 (Replaced) to match upright cabinets installed under the 15 mgd and 22 mgd expansions at the Airport WRF.
  - b. Headworks I/O Enclosure (Modified) to accommodate new FBM200s.
  - c. Blower Building I/O Enclosure (Modified) to accommodate new FBM200s.
  - d. Reclaimed Water Pump Station I/O Enclosure (Modified) to accommodate new FBM200s.
  - e. Dewatering Building I/O Enclosure (Modified) to accommodate new FBM200s.
- 4) For all panels being modified at the Pecos SWTP and Airport WRF, ANNUAL CONSULTANT assumes that sufficient space is available in the cabinet to replace the existing FBM100s with FBM200s and all associated appurtenances required for proper operation of the FBM200s.
- 5) For all panels being replaced at the Pecos SWTP and Airport WRF, ANNUAL CONSULTANT assumes that sufficient cable is available to terminate all existing signals at terminal blocks in a similar location as the existing terminal blocks.
- 6) Air conditioning will not be provided for any outdoor panels (to match existing).
- 7) ANNUAL CONSULTANT assumes that existing coaxial communication pathways are sufficiently sized and routed to provide new fiber as needed for communications.
- 8) Existing Pecos SWTP and Airport WRF Process and Instrumentation Diagrams (P&IDs) will not be modified.
- 9) Existing Pecos SWTP and Airport WRF DCS Control Descriptions/Programming will not be modified.

- 10) Existing Pecos SWTP and Airport WRF DCS "Head-end" (Solaris/Unix workstations) systems will not be modified.
- 11) Construction management and administration services are not included under this contract.
- 12) Conceptual Cost Estimating: ANNUAL CONSULTANT shall develop the various electrical and instrumentation-related conceptual cost estimates based on ANNUAL CONSULTANT's opinion, experience, and judgment only. ANNUAL CONSULTANT cannot and does not guarantee that future proposals, bids or actual Project construction costs will not vary from the conceptual cost estimates prepared by ANNUAL CONSULTANT, since ANNUAL CONSULTANT has no control over the cost of labor, materials, equipment or services furnished by others, or over any Contractor's methods of determining prices, or other competitive bidding or market conditions, practices or bidding strategies.
- 13) ANNUAL CONSULTANT shall not be responsible for the means, methods, techniques, sequences, or procedures of construction selected by Contractors, or the safety precautions and programs incidental to the work of Contractors, and shall not be responsible for Contractors' failure to carry out work in accordance with the Contract Documents.
- 14) Direct Cost Allowance included for reimbursement to ANNUAL CONSULTANT of traveling, mileage, graphics, reproductions, and other direct expenses at cost with no mark-up charges.
- 15) Owner's Design Allowance included and shall only be used with prior written approval from the City to utilize this allowance.

### **SCOPE OF SERVICES**

Based upon the Project Understanding and Assumptions identified herein, ANNUAL CONSULTANT shall complete a preliminary and detailed design.

### **TASK 100 – PROJECT MANAGEMENT, ADMINISTRATION AND DELIVERABLES**

#### **Task 101 - Project Management**

ANNUAL CONSULTANT will perform various project management and monitoring activities for the duration of the Project, including development of a Project Plan and submittal of monthly progress reports with monthly invoices.

Deliverables: Monthly progress reports and invoices

#### **Task 102 - Project Workshops**

It is anticipated that a kick-off meeting and two (2) project workshops will be conducted by the ANNUAL CONSULTANT to present a summary of the Project deliverables (drawings and specifications), including one workshop following each of the 60% and 90% deliverable milestones.

Deliverables: Workshop presentation materials (handouts) and summary notes

### **TASK 110 – REVIEW AND EVALUATE EXISTING CONDITIONS**

ANNUAL CONSULTANT will review and evaluate plant record drawings and identify locations of obsolete fieldbus modules. ANNUAL CONSULTANT will meet with CITY staff to document a list of FBM100 and I/O cabinet replacement locations.

ANNUAL CONSULTANT will conduct site inspections of the existing FBM100s to assess the current physical conditions for the following:

- Locations in which existing I/O cabinets will accept new FBM200s
- Locations in which existing I/O cabinets will not accept new FBM200s, and require replacement

ANNUAL CONSULTANT shall review and update the existing plant(s) distributed control system architecture to incorporate proposed new FBM200s and other required modifications.

#### **TASK 120 – PREPARE CONTRACT DOCUMENTS**

Preparation of Electrical and Instrumentation and Control (I&C) System detailed design contract documents shall be completed based on Task 110 and the preliminary sheet list generated by the ANNUAL CONSULTANT. The preliminary sheet list was prepared as a guide for the project. The actual number of sheets prepared by ANNUAL CONSULTANT may vary. In general, the overall design approach will be compatible and consistent with the previous design approach developed for the Pecos SWTP and Airport WRF Expansion design documents. Specific requirements of the Electrical, Instrumentation and Control (I&C) System detailed design shall be as follows:

The electrical design shall include an assessment of existing facilities. Specific items relative to electrical drawings and specifications include the following:

- Plan Drawings - Electrical plan drawings shall include both demolition and power plans to indicate location of new and existing equipment, and will include general notes, keynotes, and detail callouts. Electrical plan drawings shall not include detailed point-to-point conduit routing for every power and instrumentation cable; however, general routing of conduit shall be provided similar to the approach developed for previous Pecos SWTP and Airport WRF Expansion design documents.
- Schedules - Electrical design shall include lighting fixture and panel schedules. Detailed cable/conduit schedules shall not be provided.
- Electrical Schematics - Electrical design shall include “typical” electrical schematics supplemented with tables for multiple products, where appropriate. Repetitive and/or redundant equipment items shall not be identified with individual schematics.

The instrumentation and controls (I&C) design shall include specification of instrumentation hardware required to accomplish the distributed control and operation scheme(s), design of field alarm and display systems, and functional layout of area control centers. Specific items relative to I&C drawings and specifications shall be as follows:

- Control System - Design shall include block diagram(s) and network diagram(s) for the plant control system, including remote telemetry system and antenna.
- Control Panel Layouts - Control panel layout design shall include front exterior (face) elevation layout with nameplate and annunciator schedules, notes, and general dimensions only, along with corresponding detailed electrical schematics. Description of general panel components, including wiring and color coding standards, shall be included in the technical specifications. Layouts for panels provided by manufacturers to be provided as part of an engineered package for equipment shall not be included in design drawings. Panel layout drawings shall not include interior layouts, internal and external wiring and connection diagrams, bill of materials, detailed labeling, or detailed dimensional drawings.

#### **Task 121 Preparation of 60 Percent Plans**

ANNUAL CONSULTANT shall prepare ten (10) sets of preliminary (60%) half-size electrical and instrumentation construction documents including plans (on Bond paper) and table of contents for technical specifications, along with associated electrical and instrumentation-related construction costs. Electrical drawings shall include preliminary electrical schematics and some power plans with general panel location information (where appropriate). Instrumentation drawings shall include

preliminary panel elevations and schematics completed to an approximate 60 percent level. Plan drawings shall incorporate comments received from the CITY throughout the design phase.

ANNUAL CONSULTANT shall coordinate with CITY for review prior to and after the 60 Percent submittal.

**Task 122 Preparation of 90 Percent Plans and Specifications (Agency Review Set)**

ANNUAL CONSULTANT shall prepare ten (10) sets of 90% half size electrical and instrumentation construction documents including plans (on Bond paper) and technical specifications, along with updates to the associated electrical and instrumentation-related construction costs. Plans shall incorporate comments received from 60% submittal.

ANNUAL CONSULTANT shall coordinate with CITY for review prior to and after the 90 Percent submittal.

**Task 123 Preparation of Final Plans and Specifications**

ANNUAL CONSULTANT shall prepare ten (10) sets of final (100%) construction documents including plans and technical specifications, along with updates to the associated electrical and instrumentation-related construction costs. Final plans and specifications shall incorporate CITY comments received from 90% submittal, as well as comments generated by ANNUAL CONSULTANT's internal quality management review process.

Deliverables: 60%, 90% and 100% Contract Documents

**TASK 130 – CITY PERMITTING**

ANNUAL CONSULTANT shall coordinate with City of Chandler Development Services Division for review of electrical and instrumentation drawings and assist the CITY in obtaining appropriate building permit(s).

**TASK 140 – CONSTRUCTION MANAGER AT RISK (CMAR) COORDINATION**

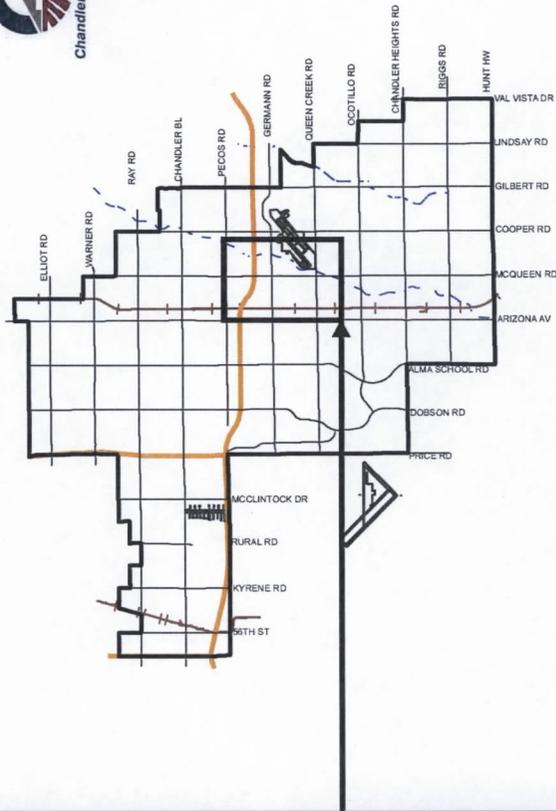
For the purposes of this Scope of Services, it is assumed that a Contractor shall be selected via a Construction Manager at Risk (CMAR) selection process. ANNUAL CONSULTANT will perform the following tasks with regard to coordinating with the CMAR:

- Review of CMAR Cost Models – ANNUAL CONSULTANT will review, comment, and advise the CITY regarding cost models submitted by the CMAR.
- Constructability Review – ANNUAL CONSULTANT will coordinate and respond to constructability review comments from CMAR throughout the design phase.
- Address Vendor/Subcontractor Questions – ANNUAL CONSULTANT will provide assistance to the CITY in answering technical questions that arise during the bidding period, and coordinate with the CMAR during this phase.
- Issue Addenda and Clarifications – ANNUAL CONSULTANT will prepare addenda required to clarify or modify the Contract Documents to answer CMAR/bidder questions.
- Conformed Drawings – ANNUAL CONSULTANT will revise Contract Documents (plans, specifications, and bid schedule) to include all changes made as a result of CMAR coordination.

**EXHIBIT B  
FEE SCHEDULE**

<b>TASK</b>	<b>SUBTOTAL</b>
<b>TASK 100 - PROJECT MANAGEMENT, ADMINISTRATION AND DELIVERABLES</b>	<b>\$6,230</b>
101 - Project Management	\$2,298
102 - Project Workshops	\$3,932
<b>TASK 110 - REVIEW AND EVALUATION EXISTING CONDITIONS</b>	<b>\$2,272</b>
<b>TASK 120 - PREPARE CONTRACT DOCUMENTS</b>	<b>\$152,592</b>
121 - Preparation of 60% Plans	\$75,256
122 - Preparation of 90% Plans and Specifications	\$58,112
123 - Preparation of Final Plans and Specifications	\$19,224
<b>TASK 130 - CITY PERMITTING</b>	<b>\$2,612</b>
<b>TASK 140 - CONSTRUCTION MANAGER AT RISK (CMAR) COORDINATION</b>	<b>\$4,874</b>
DIRECT COST ALLOWANCE (TRAVEL, MILEAGE, GRAPHICS, REPRODUCTIONS, ETC.)	<b>\$5,000</b>
OWNER'S DESIGN ALLOWANCE	<b>\$10,000</b>
<b>TOTAL</b>	<b>\$183,580</b>

# WATER AND WASTEWATER PLANT CONTROL SYSTEM UPGRADE PROJECT NO. WA1412-201



MEMO NO. CP14-125

 PROJECT LOCATION

