



City of Palo Alto

City Council Staff Report

(ID # 7624)

Report Type: Consent Calendar

Meeting Date: 3/6/2017

Summary Title: Amendment No. One to Matadero Creek Storm Water Pump Station Project Design Contract

Title: Approval of Amendment Number 1 to Design Contract Number C15158029 With Schaaf & Wheeler Consulting Civil Engineers for an Additional Amount of \$99,850 for a Total Amount Not-to-Exceed \$699,850, for Programming of the Program Logic Controllers (PLC) for Fiber Optic Connections to Pump Stations and Creek Monitors as Part of the Storm Drain System Replacement and Rehabilitation Project SD-06101

From: City Manager

Lead Department: Public Works

Recommendation

Staff recommends that Council approve and authorize the City Manager or his designee to execute Amendment No. 1 to Contract C15158029 with Schaaf & Wheeler Consulting Civil Engineers (Attachment A) for an additional amount of \$99,850 for a total contract amount not to exceed \$699,850, to develop Programmable Logic Controller (PLC) programs and configure Supervisory Control and Data Acquisition (SCADA) servers using iFIX software for communications from the new PLCs to the SCADA servers for eight pump stations and three creek monitor systems.

Background

In 2005, Palo Alto property owners passed a ballot measure to increase the storm drain fee to implement various storm drain projects to upgrade and improve the storm drain system in the City. The Matadero Creek Storm Water Pump Station Improvement Project is one of the high-priority storm drain projects identified in the ballot measure. Construction of this project, which is underway, provides an opportunity to improve other components of the creek monitoring and pump station systems.

A fiber optics connection will be installed from the PLC located at the storm water pump stations and from creek monitors to the City's fiber ring splice points. The purpose of the fiber optics connection is to enhance the speed of communication from the pump stations to the City SCADA system. Updating the PLCs at the creek monitors will greatly enhance the real time view and accuracy of the Creek Monitor page on the City website. The existing communications from the pump stations and creek monitoring station PLC are linked to the City's SCADA system by copper wire connections.

This amendment is for the PLC programming that is needed for all the new fiber connections to these storm stations and creek monitor. The hardware needed for the fiber optics line connection from the storm water pump stations and creek monitoring stations to the fiber ring splice points will be installed in the Capital Improvement Program project SD-06101, Storm Drain System Replacement and Rehabilitation.

Discussion

The additional scope of work outlined in the contract amendment consists of developing PLC programs and configuring iFIX SCADA servers for communications from the new PLCs to the SCADA servers for Matadero Creek, Adobe Creek and Airport Storm Water Pump Stations; PLC programming for the San Francisquito Creek, University Underpass, Embarcadero Underpass, Colorado and Homer Storm Water Pump Stations, Tide gate Level, Hale Avenue and West Bayshore San Francisquito Creek Level Monitoring Stations; and configuration of Local Operator Interface Terminals for local monitoring and control for all eleven stations.

Timeline

The PLC programming and configuration of iFIX SCADA for communications from the new PLCs to the SCADA servers is scheduled to be completed by October 2017, within the same time frame as the completion of the Matadero Creek Storm Water Pump Station project. The installation of fiber optics line from City storm drain pump stations and creek monitors to City fiber ring splice points including installation of necessary hardwares at the stations will also be completed by October 2017.

Resource Impact

Funding for the PLC programming and configuration of iFIX SCADA for communications from the new PLCs to the SCADA servers is available in the Storm Drainage Fund Capital Improvement Program project SD-06101, Storm Drain System Replacement and Rehabilitation.

Environmental Review

The project is categorically exempt from the provisions of the California Environmental Quality ACT (CEQA) under Section 15301 of the CEQA Guidelines and no further environmental review is necessary.

Attachments:

- Attachment A: C15158029-Amendemnt No.1-Final

**AMENDMENT NO. ONE TO CONTRACT NO. C15158029
BETWEEN THE CITY OF PALO ALTO AND
SCHAAF & WHEELER CONSULTING CIVIL ENGINEERS**

This Amendment No. One to Contract No. C15158029 ("Contract") is entered into February 6th, 2017, by and between the CITY OF PALO ALTO, a California chartered municipal corporation ("CITY"), and Schaaf & Wheeler Consulting Civil Engineers, a California Corporation, located at 1171 Homestead Road, Suite 255, Santa Clara, CA 95050 ("CONSULTANT").

RECITALS

A. The Contract was entered into between the parties for the provision of professional engineering design services in connection with Matadero Creek Storm Water Pump Station Project.

B. The parties wish to amend the Contract by increasing the compensation from six hundred thousand dollars (\$600,000) to a not to exceed amount of six hundred ninety nine thousand eight hundred fifty dollars (\$699,850) and by expanding the scope of services to include development of PLC programs and configuration of iFIX SCADA servers for communications from the new PLC's to the SCADA servers as specified in Exhibit "A-1" and Exhibit "A".

NOW, THEREFORE, in consideration of the covenants, terms, conditions, and provisions of this Amendment, the parties agree:

SECTION 1. Section 1, SCOPE OF SERVICES is hereby amended to read as follows:

"CONSULTANT shall perform the Services described in the attached Exhibit "A-1" as an addition to the Scope of Services described in "Exhibit A" of original Contract in accordance with the terms and conditions contained in this agreement. The performance of all Services shall be to the reasonable satisfaction of CITY."

SECTION 2. Section 2, TERM, is hereby amended to read as follows:

"The term of this Agreement shall be from the date of its full execution through completion of the services in accordance with the Schedule of Performance attached at Exhibit "B" of the original contract and Exhibit "B-1" of amendment No.1 unless terminated earlier pursuant to Section 19 of this Agreement.

SECTION 3. Section 3, SCHEDULE OF PERFORMANCE, is hereby amended to read as follows:

"Time is of the essence in the performance of Services under this Agreement. CONSULTANT shall complete the Services within the term of this Agreement and in accordance with the schedule set

forth in Exhibit "B" of the original contract and Exhibit "B-1" of amendment No.1, attached to and made a part of this Agreement. Any Services for which times for performance are not specified in this Agreement shall be commenced and completed by CONSULTANT in a reasonably prompt and timely manner based upon the circumstances and direction communicated to the CONSULTANT. CITY's agreement to extend the term or the schedule for performance shall not preclude recovery of damages for delay if the extension is required due to the fault of CONSULTANT.

SECTION 4. Section 4, NOT TO EXCEED COMPENSATION, is hereby amended to increase the not to exceed amount by \$99,850, to read as follows:

The compensation to be paid to CONSULTANT for performance of the Services described in Exhibit "A" and Exhibit "A-1", including both payment for professional services and reimbursable expenses, shall not exceed Six-Hundred Forty-Seven Thousand Forty Dollars (\$647,040) (the original contract amount of \$547,190.00 plus the increased amount of \$99,850). In the event Additional Services are authorized, the total compensation for Services, Additional Services and reimbursable expenses shall not exceed Six-Hundred Ninety-Nine Thousand Eight Hundred Fifty Dollars (\$699,850.00). The applicable rates and schedule of payment are set out at Exhibit "C-1", entitled "HOURLY RATE SCHEDULE," which is attached to and made a part of this Agreement.

Additional Services, if any, shall be authorized in accordance with and subject to the provisions of Exhibit "C" of the original contract and Exhibit "C-2" of amendment No.1. CONSULTANT shall not receive any compensation for Additional Services performed without the prior written authorization of CITY. Additional Services shall mean any work that is determined by CITY to be necessary for the proper completion of the Project, but which is not included within the Scope of Services described at Exhibit "A" of the original contract or Exhibit "A-1" of amendment No.1.

Additional Services for this Contract Amendment, if any, shall be authorized in accordance with and subject to the provisions of Exhibits "C" and "C-2". Consultant shall not receive any compensation for Additional Services performed without the prior written authorization of CITY. Additional Services shall mean any work that is not determined by CITY to be necessary for the proper completion of the Project, but which is not included within the Scope of Services described in Exhibit "A" or Exhibit "A-1".

SECTION 5. The following exhibit(s) to the Contract are hereby added to read as set forth in the attachment(s) to this Amendment, which are incorporated in full by this reference:

- a. Exhibit "A-1" entitled "AMENDMENT NO. ONE SCOPE OF SERVICES".
- b. Exhibit "B-1" entitled "AMENDMENT NO. ONE SCHEDULE OF PERFORMANCE".
- c. Exhibit "C-2" entitled "AMENDMENT NO. ONE COMPENSATION"

SECTION 6. Except as herein modified, all other provisions of the Contract, including any exhibits and subsequent amendments thereto, shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have by their duly authorized representatives executed this Agreement on the date first above written.

CITY OF PALO ALTO

City Manager (Contract over \$85k)

APPROVED AS TO FORM:

City Attorney or designee
(Contract over \$25k)

Contracts Administrator
(Checklist Approval)

Attachments

EXHIBIT "A-1":	AMENDMENT NO. ONE SCOPE OF SERVICES
EXHIBIT "B-1":	AMENDMENT NO. ONE SCHEDULE OF PERFORMANCE
EXHIBIT "C-2":	AMENDMENT NO. ONE COMPENSATION

**SCHAAF & WHEELER,
CONSULTING CIVIL ENGINEERS**

Officer 1

DocuSigned by:
By: *Charles D. Anderson*
Name: Charles D. Anderson

Title: President

EXHIBIT “A-1”

SCOPE OF SERVICES

Amendment No. One

The original SCOPE OF SERVICES, Exhibit “A”, is amended by adding “TASK 7: Programming and Configuration of the Project Logic Controllers (PLC) for Fiber Optic Connections to Pump Stations and Creek Monitors” to the Detailed Project Approach and Scope of Work as set forth below.

Task 7: Storm Water PLC Programming

CONSULTANT’S electrical engineering subconsultant, TJC & Associates, Inc. (SUBCONSULTANT) will develop PLC programs using the latest version of Schneider Electric’s Unity Pro (currently using version 11.0). Operator Interface Terminal (OIT) programming and configuration will be performed using the latest version of Schneider Electric’s Vijeo Designer (currently using version 4.3). SUBCONSULTANT is a Schneider Electric Automation Partner and maintains licensing and support contracts for all Schneider automation software.

Task 7.1 Pre-Programming Design

Task 7.1.1 Control Strategies & I/O List Development

SUBCONSULTANT will develop a complete I/O list for all 11 facilities and develop brief Control Strategies that define how each facility currently operates under PLC control, based on the existing FasTrak program printouts provided by City. Control Strategies shall be written on a loop-by-loop basis and include a brief narrative of the control system, a list of available manual controls, automated controls, monitored system parameters, process alarms, setpoints, and interlocks.

The I/O list and Control Strategies document will be used as the basis for testing documentation during the testing phases of the project.

Task 7.1.2 Development of Defined Function Blocks for City of Palo Alto

SUBCONSULTANT will develop Unity Defined Function Blocks (DFBs) for common functions that are used throughout the City’s PLC system. DFBs will be developed for analog scaling, analog alarming, digital alarming, flow totalization, equipment elapsed runtime meters, etc.

SUBCONSULTANT will incorporate these DFBs into the City’s Unity library so that they can be used on future city projects.

Task 7.2 Matadero, Adobe, and Airport PLC and OIT Programming

Programming and configuration work for the Matadero Pump Station, Adobe Pump Station, and Airport Pump Station will be performed on the hardware that is provided by the Contractor and Process Control Systems Integrator selected for the pump stations improvement project.

Task 7.2.1 PLC Program Development

SUBCONSULTANT will develop and document PLC programs for the following project PLCs.

- Matadero Storm Water Pump Station
- Adobe Storm Water Pump Station
- Airport Storm Water Pump Station

Programs will be fully annotated and documented. Programming will be implemented per the Control Descriptions developed under Task 1.

Task 7.2.2 SCADA Programming Development

SUBCONSULTANT will revise the existing iFIX system for monitoring and control of the three storm water pump stations. Where possible, the existing process database and graphics will be re-used. New work will be limited to where new database points and alarms are required due to the additional information available from the new pump station control programs. New data will be added to the existing displays or associated pop-up displays. Software configuration will include:

- Configuration of iFIX SCADA servers for communications from the new PLCs for the information required for this project.
- Modifications of existing graphic displays to show new process data and control points.
- Configuration of historical data collection and trending for important process values.
- Configuration of alarm monitoring for new alarm points.

Task 7.2.3 Local OIT Configuration

SUBCONSULTANT will configure Magelis local Operator Interface Terminals for local monitoring and control of:

- Matadero Storm Water Pump Station
- Adobe Storm Water Pump Station
- Airport Storm Water Pump Station

OIT graphics will use the same graphic standards and layout that have been developed for the iFIX displays.

Task 7.2.4 Project Workshops and Meetings

SUBCONSULTANT personnel anticipate attending three (3) 2-hour project workshops at the job site, or City of Palo Alto offices to coordinate with the Contractor and the City.

SUBCONSULTANT personnel anticipate participating in three (3) teleconference calls for project coordination. These are in addition to one-on-one phone calls with members of the design team.

Task 7.2.5 Witnessed Factory Testing

SUBCONSULTANT will download and install the PLC and OIT programs at the PCSI's facility prior to the Factory Testing required by Specification Section 40 60 00. During the PCSI's factory test procedure, SUBCONSULTANT programmers will verify memory mapping, scaling and functional operation of the software.

Task 7.2.6 Operational Readiness Testing and Functional Acceptance Testing

SUBCONSULTANT will provide on-site support during the PCSI's specified Operational Readiness Testing (ORT). During the ORT, SUBCONSULTANT will verify point to point testing between field devices and the SCADA system, and confirm correct analog scaling and alarms for each analog point.

Once the ORT is complete, SUBCONSULTANT will perform Functional Acceptance Testing (FAT) of all software functions in the PLC and OIT programs.

Task 7.3 Storm Water Site PLC and OIT Programming

SUBCONSULTANT will provide upgraded PLC and OIT Programming and configuration for the eight sites that the City is upgrading from the existing Modicon Compact984 PLC systems to the new Schneider Electric M340 PLC systems. Programming work will be performed on the hardware that is purchased by the City.

Task 7.3.1 PLC Program Development

SUBCONSULTANT will develop and document PLC programs for the following project PLCs.

- San Francisquito Creek Storm Water Pump Station
- University Underpass Storm Water Pump Station
- Embarcadero Underpass Storm Water Pump Station
- Colorado Storm Water Pump Station
- Homer Storm Water Pump Station
- Tidegate Level Monitoring Station
- Hale Level Monitoring Station
- West Bay SF Level Monitoring Station

Programs will be fully annotated and documented. Programming will be implemented per the Control Descriptions developed under Task 1. Data provided to the existing iFIX SCADA system will be mapped to the same memory address locations that are used in the existing PLCs so that no SCADA changes will be required.

Task 7.3. 2 Local OIT Configuration

SUBCONSULTANT will configure Magelis local Operator Interface Terminals for local monitoring and control of:

- San Francisquito Creek Storm Water Pump Station

- University Underpass Storm Water Pump Station
- Embarcadero Underpass Storm Water Pump Station
- Colorado Storm Water Pump Station
- Homer Storm Water Pump Station
- Tidegate Level Monitoring Station
- Hale Level Monitoring Station
- West Bay SF Level Monitoring Station

OIT graphics will use the same graphic standards and layout that have been developed for the iFIX displays corresponding to these sites.

Task 7.3.3 Project Workshops and Meetings

SUBCONSULTANT personnel anticipate attending one (1) 2-hour project workshops at City of Palo Alto offices to coordinate with the City staff that is performing the PLC upgrade.

SUBCONSULTANT personnel anticipate participating in two (2) teleconference calls for project coordination. These are in addition to one-on-one phone calls with members of the design team and City staff.

Task 7.3.4 Bench Testing

SUBCONSULTANT will download and install the PLC and OIT programs for the new hardware that is purchased by the City and perform Bench Testing prior to installation at the project site. Bench Testing will include verification of I/O mapping, analog scaling, simulated functional testing. Bench Testing will be performed at SUBCONSULTANT offices and the City staff may witness this testing, if desired.

Task 7.3.5 Installation, Testing, and Commissioning Support

SUBCONSULTANT will provide on-site support for City staff during installation and testing of the new PLC systems. Testing will include verification of all I/O points from field devices to the existing iFIX SCADA server, and functional testing of the new PLC and OIT programs and configuration. We anticipate testing to take two 8-hour days for storm water pump stations, and one 8-hour day for the level monitoring sites.

Task 7.4 Documentation

In addition to the actual program source files and configuration files, the primary documentation for the project software will be the detailed Control Descriptions and I/O list developed during Task 1. These documents will be maintained in the current status throughout the construction and testing phases of the project, and form the basis of the Operations Manual to be turned over to city staff at the end of the project.

Task 7.5 Warranty Period Support

At the completion of the construction phase, SUBCONSULTANT will warranty the PLC and OIT applications, developed by SUBCONSULTANT staff, against errors or bugs for a period of 12 months.

Warranty Period Support does not include regular software maintenance, program backups, software upgrades, or third-party application failures. SUBCONSULTANT can provide these services on a T&M basis under a separate contract.

Task 7.6 Project Management

SUBCONSULTANT will provide Project Management associated with the programming and software development elements of the project, including but not limited to the following:

- Coordination with the City staff throughout the duration of the project as well as Quality Assurance/Quality Control (QA/QC) activities for project deliverables.
- Coordination with the Construction Manager so that software elements meet the requirements of the project schedule.
- Coordination with process engineers to ensure that the process control system meets the requirements of the treatment plant process.

Assumptions

The scope of work detailed above is based on the current understanding of the project requirements and is based on the following assumptions:

- Initial process control descriptions will be defined and developed by SUBCONSULTANT based on reviewing the existing FasTrak program listings.
- SUBCONSULTANT anticipates performing these programming services out of its Oakland Office.
- Bench Testing will be performed using the PLC and OIT hardware that the City will purchase for upgrading the PLCs at each of the project sites. Bench Testing will be performed at SUBCONSULTANT's Oakland office.
- Travel expenses are included for Workshops, on-site coordination, testing and commissioning services.
- SCADA configuration is included for the Matadero and Adobe pump stations. It is assumed that no additional SCADA work will be required for the other sites.
- Documentation provided for this project will be provided in electronic format only. No printed copies of documentation are included.
- Factory Testing will be performed at the PCSI's testing facility and will be within 500 miles of our Oakland office.

- During testing for the software developed for the Matadero project, standby time caused by the project Contractor's lack of preparation, in excess of 90 minutes during an eight-hour work day, will be tracked and invoiced separately.
- This proposal does not include any of the hardware or software required for this project. This proposal includes labor only for development of control systems programs and associated documentation.
- Configuration of the network switches and any fiber optic converters is not included in this scope of work. These tasks will be performed by the City's IT department.
- The following items are **NOT** included within the Scope of Work detailed here or the Fee quoted:
 - o Field visits and/or attendance at construction meetings not specifically included in the scope of work above.
 - o Construction inspections.

EXHIBIT "B-1"

SCHEDULE OF PERFORMANCE

AMENDMENT NO. ONE

CONSULTANT shall perform the Services so as to complete each milestone within the number of days/weeks specified below. The time to complete each milestone may be increased or decreased by mutual written agreement of the project managers for CONSULTANT and CITY so long as all work is completed within the term of the Agreement. CONSULTANT shall provide a detailed schedule of work consistent with the schedule below within 2 weeks of receipt of the notice to proceed.

CONSULTANT (and SUBCONSULTANT TJC & A, with respect to Exhibit "A-1") will coordinate the programming schedule with the City before the start of construction. It is anticipated that the project will commence in the beginning of 2017 and be completed (excluding the Warranty Period Support) by October 2017.

**EXHIBIT “C-2”
COMPENSATION
AMENDMENT NO. ONE**

The CITY agrees to compensate the CONSULTANT for professional services performed in accordance with the terms and conditions of this Agreement, and as set forth in the budget schedule below. Compensation shall be calculated based on the hourly rate schedule attached as exhibit C-1 up to the not to exceed budget amount for each task set forth below.

CONSULTANT shall perform the tasks and categories of work as outlined and budgeted below. The CITY’s Project Manager may approve in writing the transfer of budget amounts between any of the tasks or categories listed below provided the total compensation for Basic Services, including reimbursable expenses, and the total compensation for Additional Services do not exceed the amounts set forth in Section 4 of this Agreement.

BUDGET SCHEDULE	NOT TO EXCEED AMOUNT
Task 1, Pre-Programming	\$ 10,400
Task 2, Matadero, Adobe & Airport Programming	\$ 32,450
Task 3, Other Storm Water Site Programming	\$ 47,770
Task 4, Documentation	\$ 3,530
Task 5, Warranty Period Support	\$ 2,200
Task 6, Project Management	\$ 3,500
Sub-total Basic Services	\$99,850.00
Reimbursable Expenses	\$0
Total Basic Services and Reimbursable expenses	\$99,850.00
Additional Services (Not to Exceed)	\$0
Maximum Total Compensation	\$99,850.00

REIMBURSABLE EXPENSES

The administrative, overhead, secretarial time or secretarial overtime, word processing, photocopying, in-house printing, insurance and other ordinary business expenses are included within the scope of payment for services and are not reimbursable expenses.

CITY shall reimburse CONSULTANT for the following reimbursable expenses at cost. Expenses for which CONSULTANT shall be reimbursed are:

A. Travel outside the San Francisco Bay area, including transportation and meals, will be reimbursed at actual cost subject to the City of Palo Alto's policy for reimbursement of travel and meal expenses for City of Palo Alto employees.

B. Long distance telephone service charges, cellular phone service charges, facsimile transmission and postage charges are reimbursable at actual cost.

All requests for payment of expenses shall be accompanied by appropriate backup information. Any expense anticipated to be more than \$0 shall be approved in advance by the CITY's project manager.

ADDITIONAL SERVICES

The CONSULTANT shall provide additional services only by advanced, written authorization from the CITY. The CONSULTANT, at the CITY's project manager's request, shall submit a detailed written proposal including a description of the scope of services, schedule, level of effort, and CONSULTANT's proposed maximum compensation, including reimbursable expense, for such services based on the rates set forth in Exhibit C-1. The additional services scope, schedule and maximum compensation shall be negotiated and agreed to in writing by the CITY's project manager and CONSULTANT prior to commencement of the services. Payment for additional services is subject to all requirements and restrictions in this Agreement