CITY OF
HAYWARD
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DATE: September 15, 2009

TO: Mayor and City Council

FROM: Director of Public Works

SUBJECT: Utilities SCADA Software Conversion and Programming Update: Approval of Plans and Specifications, Call for Bids

RECOMMENDATION

That Council adopts the attached resolution approving the plans and specifications for the Utilities SCADA Software Conversion and Programming Update project and calls for bids to be received on October 20, 2009.

BACKGROUND

In 1994, the City implemented a Supervisory Control and Data Acquisition (SCADA) system to monitor, gather data, and assist in control of water distribution, wastewater collection and wastewater treatment. A typical SCADA system consists of a computer at each site (e.g., pump station, reservoir, etc.) that monitors measurable parameters such as water level, pressure, temperature, flow rates, and the like ("sensors"); performs operations such as turning pumps on/off and opening/closing valves ("actuators"); and communicates with a central control computer. SCADA computers are of an industrial design such that they require custom programming and special components not typically found in personal computers.

Control Manufacturing Company (CMC) installed the City's current SCADA system in 1994. CMC provided IntelliMAC computers and worked with staff to develop and program the proprietary software that operates these computers. Before the start of this project there were 31 IntelliMACs units used for water distribution and wastewater collection, and 11 units used for the Water Pollution Control Facility (WPCF) SCADA system. SCADA has become an indispensable part of utility operations.

Programs that operate SCADA systems have changed as technology has advanced and the IntelliMAC computers are no longer available. The industry standard for SCADA computers has migrated to Programmable Logic Controllers (PLCs) which are not compatible with the IntelliMACs. Several years ago staff determined that in order to maintain an effective and reliable SCADA system, the City's existing IntelliMAC system must be upgraded and converted to a PLC-based system. Projects have been and are included in the Capital Improvement Program to address this need and to maintain the SCADA system.

The first priority in this effort was implementing the conversion to a PLC-based system at the WPCF, as the Phase I WPCF Improvement Project included installation of a PLC-based SCADA system for the new improvements. The WPCF improvements and the WPCF SCADA PLC conversion have been completed.

Conversion or transition to the new system for water distribution and wastewater collection is more complex because the SCADA system is spread throughout the City and, unlike the WPCF, relies upon radio communication. As such, its architecture is more complicated and will require additional time for conversion and implementation. The SCADA conversion and the transition to a PLC-based system are being completed by a combination of staff and consultant resources, and the services of a contractor to fabricate, test and install new SCADA panels. (A SCADA panel is what the PLC, components and wiring are mounted to, and the panel is installed inside an electrical cabinet.) The project consultant has been providing hardware, software design, and programming services, and will continue to provide these services, including record update and field services, during installation and construction.

On June 27, 2006, Council authorized the City Manager to execute an agreement with SCADA Support Group (SSG) for professional services. The agreement contained a not-to-exceed limit of $540,000 for professional services, which consisted of $176,000 for the SCADA improvements at the WPCF and $364,000 for the SCADA improvements to the water distribution and wastewater collection facilities.

On July 28, 2009, Council authorized the City Manager to negotiate and execute an amendment to the agreement with SSG for additional services. The amendment increased the not-to-exceed limit by $128,000 to $668,000 for professional services, consisting of the original $176,000 for the SCADA improvements at the WPCF and increasing the budget for the SCADA improvements to the water distribution and wastewater collection facilities to $492,000.

DISCUSSION

This project consists of the conversion, update and/or reprogramming of thirty-three (33) Remote Telemetry Units (RTUs) at sites city-wide, and the Master SCADA computer at the Utilities Center. (See Exhibit A). The work at twenty-five (25) of the RTUs will include the design, fabrication, testing, programming, and replacement of the SCADA panels. The contractor's scope of work will consist of purchasing components and materials, fabricating, testing, and replacement of SCADA panels. In addition, the contractor will be required to coordinate all work with staff and the project consultant in accordance with the project plans and specifications.

The contractor will be required to perform the SCADA panel replacement when a facility is anticipated to be the least active (e.g., when the inflow at a wastewater facility is minimal, or when the demand at a water distribution site is the lowest). As such, some night work will be required. In addition, at critical utility sites that must maintain operability, the contractor, with the assistance of the project consultant, will be required to demonstrate that the new PLC SCADA panel operates correctly prior to the disconnection and removal of the existing IntelliMAC SCADA panel. At other sites, the contractor will be allowed a limited amount of time (approximately 1 to 2 hours) to disconnect and remove the existing SCADA panel, and install and test the new one.

ENVIRONMENTAL REVIEW

The project is categorically exempt under Title 14, Chapter 3, Article 19, Section 15301(b) (CEQA Categorical Exemptions, Class 1 – Existing Facilities). The project is limited to "Existing facilities of both investor and publicly-owned utilities used to provide electric power, natural gas, sewerage, or other public utility services."

FISCAL AND ECONOMIC IMPACT

The estimated project costs are as follows:

	Estimated Cost
Administration and Work by City Crews (Labor, Equip., etc.)	$ 120,000
SSG Professional Services, Water & Wastewater SCADA	492,000
Fabrication of SCADA Panels, Testing & Install (by Contractor)	413,700
Total:	**$ 1,025,700**

The project funding is as follows:

Fund-Activity	Activity Title	Funding
614-7537	Sewer, SCADA System Record & Programming Data Update	$ 200,000
614-7538	Sewer, SCADA PLC/Radio Replacement	315,000
623-7038	Water, SCADA PLC/Radio Replacement	315,000
623-7039	Water, SCADA System Record & Programming Data Update	200,000
	Total:	**$1,030,000**

PUBLIC CONTACT

No informational meetings or items are planned for this project as all work will be conducted at City facilities, it does not involve any large or noisy equipment, and no disruptions to City services should occur as a result.

SCHEDULE

The following is an updated project schedule for this project:

Phase I – WPCF SCADA	Completed
Phase II – Water Distribution/Wastewater Collection SCADA	
Council Authorize Bidding for fabrication & installation of panels	September 15, 2009
Open Bids	October 20, 2009
Council Award contract	November 3, 2009
Complete panel fabrication and testing	March 15, 2010
Complete installation, programming and system testing	April 19, 2010
Project completed, including training and documentation	June 30, 2010

Prepared by:

Alex Ameri, Deputy Director of Public Works

Recommended by:

Robert A. Bauman, Director of Public Works

Approved by:

Gregory T. Jones, City Manager

Attachments: Exhibit A: List of Project Sites and Location
Draft Resolution

EXHIBIT A

LIST OF PROJECT SITES AND LOCATIONS

RTU/PLC Site No.	RTU/PLC Site Name	Site Address	Upgrade Required
1	Pressure Reducing (PR) Station #1	Willis Ave., near 22877 Mission Blvd.	Replace exist. IntelliMAC panel with new PLC panel
2	PR Station #2	26059 Mission Blvd. at Harder Rd.	Replace exist. IntelliMAC panel with new PLC panel
3	PR Station #5	Industrial Pkwy., near 29705 Mission Blvd.	Replace exist. IntelliMAC panel with new PLC panel
4	PR Station #8	Winton Ave. at 24011 Hesperian Blvd.	Replace exist. IntelliMAC panel with new PLC panel
5	North & South Walpert Reservoirs & Pump Station	1241 Walpert St., south of 2nd St.	Replace exist. IntelliMAC panel with new PLC panel
6	PR Station #9	26115 Hesperian Blvd. at Depot Ct.	Replace exist. IntelliMAC panel with new PLC panel
7 & 30	Hesperian Reservoir, Pump Station & PR Station #11	28471 Hesperian Blvd. at Industrial Blvd.	Reprogram Ex. Dual PLCs for Fail-Over & Convert to DF1 Radio
8	Decoto Pump Station	33755 Mission Blvd. at Decoto Rd., Union City	Replace exist. IntelliMAC panel with new PLC panel
9	Highland 250' Reservoirs & Pump Station	1122 Highland Blvd., east of Rowena Dr.	Replace exist. IntelliMAC panel with new PLC panel
10	Highland 500' Reservoir & Pump Station	1910 Highland Blvd. at Campus Dr.	Replace exist. IntelliMAC panel with new PLC panel
11	Highland 750' Reservoir & Pump Station	26633 Parkside Dr., east of Tribune Ave.	Replace exist. IntelliMAC panel with new PLC panel
12	Highland 1000' Reservoir & Pump Station	3466 La Mesa Blvd., east of Farm Hill Dr.	Replace exist. IntelliMAC panel with new PLC panel
13	Highland 1285' Reservoir & Pump Station	28750 Fairview Dr., north of Drummond Dr.	Site has PLC, Convert to DF1 Radio Protocol
14	Treeview Reservoir	31950 Veril Way, north of Chicone Ave.	Replace exist. IntelliMAC panel with new PLC panel
15	"D" Street Reservoir	1785 "D" St., east of 7th St.	Replace exist. IntelliMAC panel with new PLC panel
16	SFPUC Turnout, Fremont	Near 41416 Mission Blvd., west of Callery Ct., Fremont	Replace exist. IntelliMAC panel with new PLC panel
17	Maitland Reservoir	25561 Maitland Dr., west of Central Blvd.	Replace exist. IntelliMAC panel with new PLC panel
18	Marathon Lift Station	19180 Cabot Blvd., north of Winton Ave.	Replace exist. IntelliMAC panel with new PLC panel
19	Airport Lift Station	20355 Skywest Dr., south of West "A" St.	Replace exist. IntelliMAC panel with new PLC panel
20	Durham Lift Station	26732 Durham Way, west end of Durham Way	Replace exist. IntelliMAC panel with new PLC panel
21	Halifax Lift Station	27000 Halifax Pl., west end of Halifax Pl.	Replace exist. IntelliMAC panel with new PLC panel
22	Centex Lift Station	28021 Zeile Creek Dr., south of Dobbel Ave.	Replace exist. IntelliMAC panel with new PLC panel
23	Linden Lift Station	22533 Linden Ave., north of "B" St.	Replace exist. IntelliMAC panel with new PLC panel
24	Tennyson Lift Station	1275 West Tennyson Rd., east of Patrick Ave.	PLC previously installed as part of recent MCC Upgrade
25	Valle Vista Lift Station	1810 Pacheco Way	Site has PLC, Upgrade display, Convert to DF1 Radio Protocol
26	SFPUC Turnout, Newark	8650 Thornton Ave., near 37140 Hickory St., Newark	Replace exist. IntelliMAC panel with new PLC panel
27	Garin Pump Station	935 Garin Way	Replace exist. IntelliMAC panel with new PLC panel
28	Garin Reservoir	29894 Bello View Pl.	Replace exist. IntelliMAC panel with new PLC panel
29	Eden Shores Pump Station	2695 Eden Shores Blvd., south end of Lakeport Dr.	Replace exist. IntelliMAC panel with new PLC panel
31	Highland 1530' Reservoir	30100 Fairview Ave, east end of Country Club Dr.	Site has PLC, Convert to DF1 Radio Protocol
32	EBMUD Intertie Valve Vault	1101 Golf Course Rd. at Hesperian Blvd.	Site has PLC, Convert to DF1 Radio Protocol
33	Skywest Pump Station	22487 Skywest Dr. at Hesperian Blvd.	Reprogram Ex. Dual PLCs for Fail-Over & Convert to DF1 Radio
MASTER	Utilities Center SCADA Master	24499 Soto Rd., west of Jackson St.	Reprogram for PLCs and DF1 Radio Protocol

DRAFT

HAYWARD CITY COUNCIL

RESOLUTION NO. 09-___

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9/4/09

Introduced by Council Member_____

RESOLUTION APPROVING PLANS AND SPECIFICATIONS FOR THE UTILITIES SCADA SOFTWARE CONVERSION AND PROGRAMMING UPDATE PROJECT, PROJECT NOS. 7038, 7039, 7537 AND 7538, AND CALL FOR BIDS

BE IT RESOLVED by the City Council of the City of Hayward as follows:

1. That those certain plans and specifications for the Utilities SCADA Software Conversion and Programming Update Project, Project Nos. 7038, 7039, 7537 and 7538, on file in the office of the City Clerk, are hereby adopted as the plans and specifications for the project; and

2. That the City Clerk is hereby directed to cause a notice calling for bids for the required work and material to be made in the form and manner provided by law; and

3. That sealed bids therefor will be received by the City Clerk's office at City Hall, 777 B Street, Hayward, California 94541, up to the hour of 2:00 p.m. on Tuesday, October 20, 2009, and immediately thereafter publicly opened and declared by the City Clerk in Conference Room 4D, City Hall, Hayward, California; and

4. That the City Council will consider a report on the bids at a regular meeting following the aforesaid opening and declaration of same; and

5. The project is categorically exempt from review under Title 14, Chapter 3, Article 19, Section 15301(b) (CEQA Categorical Exemptions, Class 1 – Existing Facilities).

IN COUNCIL, HAYWARD, CALIFORNIA _____, 2009

ADOPTED BY THE FOLLOWING VOTE:

AYES: COUNCIL MEMBERS:
MAYOR:

NOES: COUNCIL MEMBERS:

ATTEST: COUNCIL MEMBERS:

ABSENT: COUNCIL MEMBERS:

ATTEST:_____
City Clerk of the City of Hayward

APPROVED AS TO FORM:

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City Attorney of the City of Hayward