

SECTION 17902
SCADA SYSTEMS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The work of this section shall be performed by a qualified System Integrator and includes providing and installing SCADA computer system hardware, software and peripherals as indicated herein and as shown on the Contract Drawings. The System Integrator shall have a minimum of ten systems in water or wastewater applications based on the approved SCADA system software and the PLC software that is submitted. It also includes system installation, modification to the SCADA system software, system implementation, testing and start-up and follow-up system testing at three months after completion. The System Integrator shall be TESCO Controls, Meyers Controls or pre-approved equal.
- B. The System Integrator shall provide all materials, labor, interconnection cabling, software and supplemental equipment, middleware and software modules as required to provide a fully operational system.
- C. The System Integrator shall furnish SCADA servers, workstations, client computer systems, communications hardware and software, all hardware and software required for a functional operating SCADA system as shown on the Contract Drawings and specified hereinafter
- D. A new Runtime-based SCADA system shall be provide to replace the existing Lookout based SCADA system. The new Runtime-based SCADA system shall duplicate the existing Lookout based SCADA program and will include the SCADA and Historical Database requirements associated with the Water System Improvements.
- E. Existing Conditions: The existing SCADA System currently consists of these components:
1. Existing SCADA system computer located Existing Operation Building consisting of a System Database Server and a SCADA Graphics Client including telephone-based communications, telephone communication of autodialer based alarms.
- F. Modifications:
1. The existing SCADA system will remain in service until the new replacement SCADA system is installed and fully operational.
 2. Telephone communication of autodialer based alarms will remain in service until the new replace SCADA system autodialer software is installed and fully operations.
 3. The existing SCADA system, autodialer system and database system functions shall be duplicated in the new replacement SCADA system that is capable of handing the I/O

requirements associated with the existing and the improvements associated with the Water System as indicated in the contract documents.

1.02 RELATED SECTIONS

- A. The contractor shall provide hardware and software compatible with equipment, systems and services specified in the following sections:
1. Division 01.
 2. Division 16
 3. Division 17

1.03 SUBMITTALS

- A. Provide submittals as specified in Section 17010 for all SCADA system components..
- B. Submit original operations and maintenance manuals for the Lookout Runtime software and for the Autodialer Software. CD versions are acceptable.
- C. Submit data sheets and catalog cuts for:
1. The SCADA Server Computers.
 2. Uninterruptible Power Supplies.
 3. Ethernet Switches and Hubs.
 4. Media Converter.
- D. Submit wiring diagrams and electrical/electronic schematics for:
1. Power connections to the computers.
 2. Ethernet Network between Computers.
 3. Ethernet Network between SCADA System and the PLCs.
- E. Provide SCADA software configuration software, manuals, and disks licensed to the Owner six weeks prior to the start of any factory SCADA tests. Provide and submit proof that the software packages are licensed to the Owner when the software is delivered to the Owner. Provide and submit proof that a two year software maintenance/upgrade package has been purchased for the Owner. It is the System Integrator's responsibility to obtain SCADA software, manuals and disks necessary for the System Integrator to program and configure the SCADA system.
- F. Submit manufacturer's warranty certificates for items supplied under this Section.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The contractor shall retain the services of a Control System integrator to provide complete, assembled, installed & setup all new hardware components and replacement of existing components associated with the SCADA system modifications, load all software and develop the SCADA program additions. The System Integrator shall have a minimum of ten systems in water or wastewater applications based on the approved SCADA system software and the PLC software that is submitted. The System Integrator shall be Tesco Controls, Meyer Control Corporation, or pre-approved equal.

2.02 COMPUTER SYSTEMS GENERAL

- A. Regardless of the version and series specified hereinafter in these specifications, the computer hardware and software shall be the latest series and versions manufactured and available at the time of the CONTRACTOR's Bid. All computer hardware and software shall be compatible within the system.
- B. Computer hardware shall be supplied by a single manufacturer.
- C. Software shall be the latest proven versions available by the software vendor. Alpha or beta software versions are not acceptable. All software shall be compatible with the furnished hardware throughout the Plant, unless otherwise approved by the Engineer.
- D. The SCADA system shall be a single computer configuration as shown on the Contract Drawings.

2.03 COMPUTER HARDWARE

- A. A SCADA computer shall be provided as shown on the Contract Drawings at the location shown. The SCADA computer shall be provided and installed with all computer hardware, software, communications devices, cabling and configurations as specified herein and within applicable specification sections.
 - 1. SCADA server workstation hardware shall be:
 - a. Intel Dual Core Xeon, 1.88 GHz, Tower
 - b. 4.0 GB DDR3 1066 MHz Ram
 - c. 512 MC 3D graphic video card
 - d. Internal CD-RW Drive and DVD-RW Drive
 - e. 750GB SATA with 16MB Databurst Cache.
 - f. Computer Interface ports

- 1) Two Serial RS-232 ports
 - 2) Two 10/100 Ethernet Network Interface Card (NIC)
 - 3) Four Universal Serial Bus (USB) ports
 - 4) PS2 mouse and keyboard ports
 - 5) One parallel interface port
- g. Minimum of four PCI expansion slots
 - h. Minimum of two expansion bays
 - i. 23" High Resolution professional style monitor, flat panel.
2. Three Year ProSupport Warranty and 3 Year NBD On-site service package.
 3. The computer system shall be Dell Precision Workstation 5500, Hewlett-Packard, Lenovo or an approved ARRA compliant equivalent.

B. Software:

- a. Operating System, Windows Vista Ultimate, 32 bit edition.

2.04 SYSTEM SOFTWARE

- A. SCADA HMI software shall be a full featured SCADA package including HMI (Human-Machine Interface); Historian Database; Software Tool Set for trending, analysis, and reporting data collected by the historian; and autodialer software. The SCADA Software Suite shall be Wonderware MuniPlatform Development/Runtime 5K/5K/IK, version 3.1A, Rockwell Automation RS View or an approved ARRA compliant equivalent.
- B. The System Integrator shall provide SCADA and Historical Database software with the performance, functionality and configuration requirements as specified herein and within applicable specification sections.
- C. PLC communications and diagnostics software shall be installed on each SCADA Server and Workstation Node. The communications driver and diagnostic tools shall be Allen Bradley RSLinx and RSGateway, Modicon Quantum or an approved ARRA Compliant equivalent.
- D. Support software shall be provided on all SCADA servers and workstations. Support software shall be provided to allow for spreadsheet and report development, word processing, normal operations, diagnostic, file sorting, navigation, file recovery, file back-up and system restoration. The following support software shall be supplied on each machine residing on the SCADA Local Area Network (LAN) or approved ARRA Compliant equivalents.
 1. Norton Antivirus Corporate 8.5 Server Edition, latest version (Historical Server).

2. Norton Antivirus Corporate 8.5 Workstation Addition, latest version.
3. Diskkeeper 7.0 SE & Undelete 3.0 by Executive Software, latest version.
4. Microsoft Office Suite, Professional, latest version.
5. Print Screen Utilities, Capture EZ, latest version.
6. Veritas Backup Exec Remote Agent for Windows, System Back-up Client Software, latest version.
7. File Compression and Management, WinZip Computing Inc. WinZip latest version.
8. PDF file creator and viewer, Adobe Acrobat 6.0, latest version.
9. Network Management and Security software shall be as specified.

2.05 PORTABLE STORAGE/BACK-UP SYSTEM

- A. One portable storage/back-up systems shall be provided to allow for local transfer of files, back-up and restore procedures at the facilities.
- B. The portable storage device shall interface with the computer via a USB connection and have maximum capacity available. As a minimum, the capacity shall be 60 GB.
- C. The portable storage unit shall be provided with all software and peripherals necessary to allow for portable access between computing systems.
- D. The portable storage unit shall be Iomega, Seagate or approved equal.

PART 3 - EXECUTION

3.01 GENERAL

- A. The System Integrator shall provide new computer workstation complete, assembled, tested and loaded with all software and applications configured prior to installation.
- B. The System Integrator shall successfully conduct a witnessed factory test of all computer hardware and software systems in accordance with sections 17510 and 17512.
- C. All software shall be installed with the latest system proven patches, service packs, security patches and revisions compatible with the most recent Microsoft operating system and Intellution software versions.
- D. All system hardware shall be provided with the latest firmware, BIOS, device drivers and patches.

- E. All software and Icons not applicable to the operation of the SCADA system workstation, and Historical Server shall be removed from the system. The contractor shall coordinate specific software applications that shall remain on the system with Owner personnel prior to system delivery. All games shall be removed from the system.

3.02 COORDINATION

- A. The SCADA computer system shall be arranged and placed in Operations Building as noted on the contract drawings.

3.03 INSTALLATION AND SERVICE – EXISTING OPERATIONS BUILDING

- A. The existing System Database Server and the existing SCADA Graphics Client functions shall be replicated into the new SCADA computer and the functionality of existing SCADA and database application programs expanded to include the SCADA system requirements associated with the new domestic water system modifications.
- B. The new SCADA Computer shall be factory tested and approved by the Engineer prior to installation at the treatment plant site. The system integrator shall provide temporary computers at their factory testing facility to simulate the Site Computer System, if required.
- C. The new SCADA computer system maintain communication with all of the existing SCADA points as well as incorporating the new SCADA points as described in the control strategies presented in Specification Section 17924

3.04 TRAINING

- A. The System Integrator shall schedule, reserve, purchase and coordinate factory HMI/SCADA and Historian training for two individuals in each training class. The training shall be provided as follows:
 - 1. SCADA HMI basic training.
 - 2. SCADA HMI advanced training.
 - 3. Historian training.
- B. In addition to the factory SCADA/Historian training the System Integrator shall provide 5 days of application training specific to the onsite configuration and operation of the SCADA/HMI, Historian, Database applications and reporting. The training classes shall provide for the following training curriculum:
 - 1. Basic SCADA/HMI configuration and navigation
 - 2. Basic SCADA/HMI operation
 - 3. Report Generation
 - 4. System Back-up and Restoration

5. Database compression, archiving and restoration
 6. Basic system diagnostics for SCADA and PLC communications.
- C. Prior to the commencement of any training session the System Integrator shall submit a detailed training schedule and curriculum for review and approval. The training curriculum shall address the training items, effort and objectives for each day.

3.05 WARRANTY

- A. Prior to final acceptance, the Contractor shall furnish the Owner with a listing of warranty information for all manufacturers of materials and equipments supplied under the scope of work covered in this section. The following:
1. Manufacturer's name, service contact person, phone number and address.
 2. Material and equipment description, equipment number, part number, serial number and model number.
 3. Warranty expiration date.
- B. The following services shall be provided during the one year warranty period (from Owner's final acceptance of the plant):
1. The Contractor and System Integrator shall warrant all equipment for a period of one (1) year from date of final acceptance. Standard published warranties of equipment which exceed the preceding length of time shall be honored by the manufacturer.
 2. The Contractor and the System Integrator shall provide all material to replace or repair any hardware that fails during the warranty period, at no additional costs to the Owner.
 3. The Contractor and the System Integrator shall determine and report the cause of any failure associated with any portion of the new SCADA computer system that is returned for service.
 4. The System Integrator shall provide 100 hours of additional SCADA software development time for any screen modifications, changes or additions required by the Owner during the warranty period.
 5. The System Integrator shall provide one year of warranty service for the correction of operational inconsistencies resulting from the configuration and application programming effort. The warranty shall include two site visits for hardware cleaning, diagnostics, file maintenance, and a full system application back-up. The site visit shall also include a full system and configuration back-up to restorable media compatible with the storage equipment
 6. The System Integrator shall provide free technical support on equipment for a period of one year starting from the date of final acceptance. Support shall be provided from the

System Integrator and the SCADA software supplier. Phone support shall be available a minimum of Monday through Friday from 8 AM to 5 PM, Pacific Time.

7. The System Integrator shall provide follow-up system testing at three months after completion

3.06 ACCEPTANCE

- A. Final acceptance will be given by the Owner after the equipment has been "field tested" satisfactorily, each deficiency has been corrected, documentation has been provided, and all the requirements of contract documents have been fulfilled..
- B. At the end of the project, following completion of the field tests, and prior to final acceptance, the System Integrator shall provide the following to the Owner:
 1. Each "operation and maintenance" manual shall be modified or supplemented by the System Integrator to reflect all field changes and as-constructed conditions.
 2. Sixteen (16) hours of training on the use of the SCADA computer system program.

****END OF SECTION****